ASLA Climate Action Committee
Southeast Regional Event: October 29, 2020
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CLIMATE ACTION OVERVIEW – Katie Riddle

Katie Riddle: Welcome to today's Southeast Region Climate Action event hosted by the ASLA Climate Action Committee. I'm Katie Riddle, director of professional practice at ASLA, and on behalf of our speakers, I want to say thank you for joining us today for this conversation, which is just what we want this to be: a conversation among our climate action leaders and among all of you.

We are going to address issues most pressing to the Southeast states of North Carolina, South Carolina, Georgia, and Florida and we welcome your comments and questions in the chat box. You're welcome to raise your hand if you want to jump in and unmute yourself. We will be monitoring that box throughout our time together and at the end, we'll leave time for Q&A and an open dialogue for anyone who wants to join our climate action leaders in conversation. And we're very hopeful that you all jump in and are thinking about questions and want to share your own experiences as practitioners or educators or students with us today.

Climate change is one of ASLA's key priorities. Recognizing built and unbuilt work that addresses climate issues through our website resources are online learning, our conference education and our awards.

If you have not already visited, we invite you to visit climate.asla.org, where we host a number of project case studies that exemplify climate change and resilience strategies from our Smart Policies for a Changing Climate report.

On the federal side, our government affairs team works with legislators on Capitol Hill to pass legislation that impacts your practice and allows landscape architects more opportunities to expand their practice areas to address the climate crisis.

And if you haven't had a chance to watch ASLA President Wendy Miller's presentation that she shared in August, I invite you to check it out. It's a great recap of ASLA's work and our members' work on climate change issues.

In January of this year, the Climate Action Committee was actually formed out of a subcommittee from the Professional Practice Committee, which really has been an incubator for a lot of ideas and other committees. We're excited to have this as a standing committee; they've really hit the ground running this year, specifically with this idea of bringing chapters and universities together for a series of regional conversations with our members.

We've asked chapter presidents and trustees and universities to identify climate action leaders to help guide these discussions, and we're joined by a number of our climate action leaders today.

This Southeast region is our pilot event, and we're all very glad that you could join us. We're excited to kick off the series with everyone today, as we work to develop a broader network around climate action and identify the best way to collect and share and distribute resources to help you all work together as a region and collectively find solutions to climate issues.

INTRO TO REGIONAL EVENT – Andy Fox

Andrew Fox: Good afternoon, everyone. My name is Andy Fox; I'm a Professor at NC State College of Design within the department of landscape architecture and environmental planning where I also direct the Coastal Dynamics Design Lab.

I'm pleased to be here and very excited about this pilot event. This is the first one, so this is the beginning of what we hope to be a long and productive conversation with the membership defined broadly—so, practicing professionals, academics and researchers and educators and also, of course, very importantly, the student body of the universities within the region who bring all kinds of amazing ideas, creativity, work ethic, and entrepreneurialism into this space of climate action. So we're very excited that you're all here. Thank you for attending.

I'd also like to acknowledge very quickly others who have been involved with setting this up, and idea turned into an event. Vaughn Rinner, the Chair of the ASLA Climate Action Committee, is located in Seattle, and has been involved with the organization this particular event. It truly takes a village. We are thankful to have such a great team.

Our event today is building on a regional construct as a beginning point to initiate discussion around bio-regional and eco-regional threats and opportunities to practice. The intent of dividing the country into regions is to really think about bioregional and ecoregional threats and opportunities, as well as shared issues. We understand that there's overlap between the Southeast and Mid-Atlantic and the Southeast Coast and Gulf Coast, and so forth. We tried to find a balance of membership numbers and issues so that we could facilitate at least the initial discussions.

I also want to recognize the ancestral lands and territories of indigenous peoples in which this panel resides: the Tuscarora, the Waccamaw, the Natchez, the Muscogee, and the Seminole. There's much to learn from indigenous knowledge and I think it's important to recognize that this knowledge is a part of Climate Action discussions.

Our conversations to date have been with climate action leaders from each state chapter and university program in the Southeast Coast Region. We have had a couple phone calls and we acknowledge that the discussion items that we begin with today do not cover all the issues. But what we want to do is use a few common themes to get the conversation started.
The purpose this meeting is to seed the broader conversation. We want to begin documenting, organizing, prioritizing, and building consensus and advocacy around common themes, so that we as a discipline can strategically take action on these issues. More specifically, the weather events of the last 24 hours within

this region are yet another reminder of the urgency in which we as professionals and informed members of our society must act on climate change issues. Hurricane Zeta is the 27th named Atlantic based storm. 27—it's crazy. This has been a record-breaking season and specific to our region. Today we have hundreds of thousands of people without power, just one element of how climate change impacts us every day.

So to dive into the issues and the discussion today, our framework is to have a 15-20-minute discussion around a set of regional climate issues and then we'll shift into brief presentations from each of the panelists that describe current and emerging policies, programs, and projects within their respective states.

We'll spend the rest of our time responding hopefully to questions that you all have either through the chat or asking those questions and engaging in a conversation with the general audience. Again, this is part of starting to record the broad issues identified by landscape architects, not just members of this particular committee or panel. The Q&A and discussion is key to the success of the event.

PANELIST INTRODUCTIONS

In addition to the panelists, attending are some regional Climate Action leaders in the region who aren't speaking on the panel today. The Georgia Chapter representative is Curt Jackson. From the University of Florida we have Andrea Galinski, and from Florida International University we have Linda Chamorro. that are on the action leader group. I will turn the floor over to our esteemed group of panelists to introduce themselves.

Stephanie Kelly:

I am happy to be here, and thanks to ASLA staff and our national Climate Action leaders for their vision and for putting this regional platform together. I am a North Carolina native, currently living on the coast in Wilmington, North Carolina. I am a licensed landscape architect working for a small interdisciplinary commercial design firm based in Raleigh called HagerSmith Design. I'm also a dual master's student. I have gone back to NC State to pursue a Masters of Climate Change in Society from the Marine, Earth, and Atmospheric Sciences Department, and also a post professional Master of Landscape Architecture with a Certificate in Disaster Resilience. I have also been a volunteer with the US Green Building Council in NC for the last 13 years, where I focus my efforts on sustainability in the built environment.

Erin Stevens:

My name is Erin Stevens. I was born and raised in the Charleston area, where I live now. I grew up on a small barrier island off the coast of Charleston. I am founder and president of a small landscape architecture and urban design firm called Surculus. We focus on resilient design and integrating ecological processes into the built environment. I also teach within the Master of Resilient Urban Design program at Clemson University that is based in Charleston at the Architecture Center. I am happy to be here to talk about the issues that we see in the Low Country of South Carolina.

Alfie Vick:

My name is Alfie Vick. I'm a professor here at University of Georgia and the college of environmental design. I'm actually a southeastern transplant. I grew up in Chicago, but moved to Georgia in 1995 for grad school, and I've been here ever since. Worked in private practice in Atlanta for about 10 years before coming back to Athens to teach and I'm glad to be here with you and look forward to our conversation.

Emily O'Mahoney:

I am Emily O'Mahoney. I grew up in New York and New Jersey, but since college in 1975 I have been located in Florida. Since I graduated, I have been in the southeast part of Florida in private practice. I am a partner in the firm of 2GHO, which is in Jupiter, Florida. Florida has a lot of coast and I have not been far away from it during my career. I see firsthand a lot of what's going on. I am very involved in the Florida Chapter. We have been working with sustainability for a long time. It is how we are educated and is what we do. Climate change just needs to come to the forefront now.

OVERVIEW OF CLIMATE CHANGE ISSUES

Andrew Fox:

In our preparatory calls we identified a number of shared issues within each state. There is, of course, a lot of diversity in an individual state like North Carolina, with Coast, Piedmont, and mountain areas. This is similar in South Carolina and Georgia, and then stretching all the way down to South Florida. There is a range of landscape types. We are not initially trying to identify all the issues, but instead a core set to start., One major issue is coastal sea level rise. Erin will lead off with a quick discussion about sea level rise effects in Charleston.

- **Sea Level Rise in Charleston, South Carolina – Erin Stevens**

It goes without saying that in a place identified as the Low Country, where the bulk of our land mass is only a few feet above sea level, sea level rise is really a crisis. It is something that we think about frequently in our work.

Over the last several years, we have seen a lot more of what is called "sunny day flooding". We are seeing flooding throughout the city of Charleston on days where we do not have rain. The flooding is all tidal influenced. As landscape architects, it is really important for us to think about the hydrological issues in our projects, how the water is absorbed into and moves through the landscape. We think about how we can design the landscape to be more enduring.

We are facing issues of saltwater inundation as well as more frequent flooding, resulting in more standing water. It is not something that we can avoid when right on the coast at such a low elevation.

- **Sea Level Rise in Florida – Emily O'Mahoney**

Florida has the same problems. A lot of Florida is very low, especially along the coast, and water comes out of the drainage system into the street because of the way the storm system is designed. This is the experience of sunny day flooding.

Andrew Fox:
We are also experiencing changing rainfall intensities and extreme precipitation events Alfie, please describe for us how you're feeling some of those effects in the state of Georgia.

- **Inland Flooding in Georgia - Alfie Vick**

In the metro Atlanta area, where we are not dealing with sea level rise, we are still dealing with flooding issues. Over the last 15 plus years it has felt like a precipitation roller coaster. We have extreme wet years, and we have extreme dry years. We have extreme precipitation events and then might have a following three months of drought. It is very much a wet or dry cycle. We have increased attention focused on mitigating these impacts. The City of Atlanta, for example, has a really progressive green infrastructure ordinance that is mandating retaining the first inch of precipitation on any new development site. Such policies are a really positive reaction to the changes that we've seen.

I think we need to stay on our toes. With all of our green infrastructure, we're need to continue to understand how precipitation intensity and distribution continues to change in order to size and design green infrastructure appropriately for the climate context.

Andrew Fox:
So from that kind of urban Piedmont back down to Charleston. How are you feel the effects in Charleston related to changing rainfall intensity?

- **Compound Flooding in Charleston - Erin Stevens**

We are getting these very intense rainfalls. Even when they happen further upstate, the rivers are moving towards the coast. While the sea level is rising, we are having more extreme tides, and also intense rainfall. We end up with what we are calling compound flooding, because our water has nowhere to go. If we have a really intense rainfall when the tides are too high, the water that typically would flow out to sea can't get out. And so in the same way. The water just can't move freely in the way our systems were designed. The two issues really exacerbate each other.

Andrew Fox:

With rising tides and with extreme precipitation, the problem comes to a head with a lot of the hurricane threat that this region faces. Stephanie, can you share with us how we're experiencing that in North Carolina?

- **Hurricane Intensity in North Carolina - Stephanie Kelly**

We have been seeing slower tracking, slower moving, wetter, and more intense hurricanes that are happening more frequently. Since I moved to Wilmington in 2014, I have lived through Hurricane Matthew, Hurricane Florence, Hurricane Dorian, and Hurricane Isaias. Hurricane Florence was a really tough one for our community. For two days the hurricane lingered over our coast. I was watching our neighborhood flood with water levels rising and getting close to my house. It was about four feet away from coming inside. Highway 40 was completely submerged for almost a week. Half of the City of Wilmington became a virtual Island.

Andrew Fox:

Thank you for touching on a really important point that the mental health considerations can sometimes get lost in these big storm events and disasters. Disaster survivors require really holistic thinking around how that takes place.

Related to Hurricane impacts, somehow Florida has kind of avoided the worst of this particular hurricane season. Emily, can you talk about some of the effects when Florida is in the bullseye.

- **Hurricanes in Florida and Beach Erosion – Emily O'Mahoney**

I have been in Florida since 1975 and I don't personally remember early hurricanes. We really didn't have a major hit until Andrew in 1992. That experience changed codes. But then in 2004 and 2005 we had four hurricanes. We had two hurricanes three weeks apart where I was living. They were slow and they were all day. I mean, it was quite interesting. I watched our area go from grabbing for plywood to, over the last 20 years, aluminum hurricane shutters. We are armoring our own houses, but the storms have also played havoc with our shorelines. Even if you don't get a direct hit, all the wave action is destroying our beaches. The beaches naturally do littoral drift, but can't because of all the built environment.

Andrew Fox:

Another threat that was identified by the group is urban heat island. As we become more urbanized and warmer, we are thinking about how the urban heat has an effect on human health and ecological health. Atlanta is one of the major metros, if not the largest major metro in this region.

- **Urban Heat Island in Georgia - Alfie Vick**

I definitely want to acknowledge that there are certainly ecological impacts related to urban heat island, but I do want to focus on the health consequences. Atlanta, as a big metro area, certainly has a major heat island issue. 2019 was the warmest year on record for the state of Georgia, surpassing two of the previous warmest years on record in 2016 and 2017. We are on an unfortunate trend. Within these metro areas we see health impacts, a direct threat to health and well-being from exposure to intense heat. I have been told that heat related illness causes more deaths in the United States than all other weather-related natural disasters combined, but it kind of goes unseen. A lot of the time the impacts are felt by those that already are experiencing health inequities due to circumstances related to poverty or other related issues. Heat is exacerbating those existing issues and is a real problem.

Air pollution and the pollen season are also worsening issues. The pollen season is expected to continue to extend with increased temperatures. The warming weather is affecting people with seasonal allergies, asthma, and respiratory diseases. There is also concern about increased or changing distribution and patterns of infectious diseases that that we are struggling to anticipate. There is certainly a complex of interrelated issues with urban heat island and human health.

- **North Carolina Urbanization - Stephanie Kelly:**

I want to give a broader global picture. I think the UN projected that by 2050 68% of the world's population would live in urban centers. North Carolina is certainly following this trend. Historically, we've been a rural agricultural textile state, but we are quickly growing. From 2010 to 2018 we were the fourth fastest growing state in the nation. Brunswick County, which is the most southeastern county in North Carolina, is the fastest growing county in the state and also the most vulnerable along the coast.

With increased urban centers, we are also seeing an increasing urban heat island effect. One study of 50 large US cities found that our capital city, Raleigh, is one of five cities that is seeing increasing trends in all facets of heat waves, including frequency, duration, intensity, and timing.

This urbanization is leading to a rapid decrease in ecosystem services due to a decrease in diversity. Ecosystem services are regulating services, including stormwater interception and storage, carbon sequestration, buffering from extreme weather like hurricanes, soil formation, and pollination. This has economic consequences for our state, including impacts on the tourism industry, which employs 9.3% of our folks, as well as agriculture and forestry, which is our number one industry. So as we're rapidly urbanizing, now is the time to really start to think about smart growth green infrastructure in strategic conservation.

CLIMATE CHANGE AND EQUITY

Andrew Fox:

I'd like to close out this segment of the discussion and bring it all together with a really important element that came up in all our discussions. That is equity as related to climate change. I would like each of the panelists to give a quick response in terms of who is most vulnerable to the changing climate. What are the trends in your state and thoughts on how we adjust to be able to serve those populations and communities.

- **Mobility of Populations and Municipal Responsibility - Erin Stevens:**

One thing that is really important to emphasize is climate change causes extreme situations fairly rapidly. People who have less mobility and less resources have greater difficulty in getting out of harm's way. They have fewer other places that they can move to and other people they can rely on are also more vulnerable to the issues.

There is a huge responsibility for municipalities to make sure that they are implementing ordinances and regulations into their zoning codes that ensures that there is mobility and access to resources for all citizens and not just for those who can afford to buy them for themselves.

A lot of the most vulnerable populations live in the most frequently flooded areas, because they were often placed on fill in former wetland areas. The non-flooding properties are becoming more valuable simply

because they don't flood. That is creating a socio-economic divide between those who can afford to live in safer places and those who cannot.

Andrew Fox:

There has been a lot of discussion about sea level rise and kind of a retreat, moving to higher ground even within South Florida.

- **Retreat and Municipal Responsibility - Emily O'Mahoney:**

A lot of the Florida coast is very built up, and usually people are wealthy who live along the coast. I believe that they will barricade themselves as long as they can instead of retreating. Inland where the rivers come up may result in more retreat.

I agree that we need to work with the municipalities to identify issues. We need to work on the issues like the heat island effect to make it better for everyone because of the health issues. Tree canopy is important because it does mitigate some of that heat island effect.

- **Retreat and Indigenous and Land-Based Populations - Alfie Vick:**

I think a lot of the issues in terms of equity have been covered. One thing I would like to highlight is indigenous populations. While there aren't many indigenous communities left in the southeast, I've done some work with the Eastern Band of Cherokee Indians. They are concerned about the impacts of climate change on their community, mainly because they are locked into a land base. It is a pretty small land base. If resources and access are reduced, they will need to shift and move. This a real source of concern for them. I believe that many communities that are locked into a particular land base are going to be very vulnerable to many different consequences of climate change.

- **Retirement Populations and Community Engagement - Stephanie Kelly:**

Another consideration for coastal areas is that there is a large retirement population. This older population has more challenges with evacuations, especially during a pandemic. We need to have good coordination and communication between government agencies and the public. Community engagement is extremely important. Education and outreach are things that our profession can help with.

POLICIES, PROGRAM, AND PROJECT EXAMPLES

Andrew Fox:

We are going to present some examples of how we are starting to address some of these issues. These are snapshots of policies, programs, and projects within each state. We need to move further into action and to operationalize ideas.

NORTH CAROLINA - Stephanie Kelly:

I want to start by taking a quick look back to 2012. North Carolina made national and international headlines for outlawing climate change. This happened as a result of the report issued by our state scientist outlining sea level rise projections for the next hundred years. The report received immediate backlash from developers and special interest, which caused our General Assembly to swiftly pass a law implementing new regulation for building communities. On his TV show, The Colbert Report comedian Stephen Colbert presented a headline saying that if your science gives you a result that you don't like, just pass a law declaring that the scientific result is illegal, and your problem is solved.

NORTH CAROLINA HIGH LEVEL POLICY AND PLANNING EFFORTS

Governor Executive Order Committing to Paris Climate Agreement:

North Carolina has come a long way. On October 29, 2018, our governor Roy Cooper issued an Executive Order that presents our state's commitment to the Paris Climate Agreement. By addressing climate change through a transition to a clean energy economy over the next five years, the directive aims to decrease state greenhouse gas emissions and increase the number of registered zero emission vehicles. It has a goal of decreased energy consumption in state owned buildings. It also directs the development, implementation and evaluation of programs and activities that support statewide climate mitigation and adaptation practices. It gives specific directives to state government agencies in order to accomplish these goals as part of coordinated efforts.

Climate Change Interagency Council:

The executive order was supported by the creation of the Climate Change Interagency Council that is spearheaded by the North Carolina Department of Environmental Quality. This is an important first step because government departments and agencies tend to work in silos. This high level cross-sectional approach is progress towards successful climate mitigation and resiliency efforts.

North Carolina Climate Risk Assessment and Resilience Plan and Community Engagement:

Another outcome of this interagency effort has been the publication of the ***North Carolina Climate Risk Assessment and Resilience Plan***. It is a well-organized document easy to read with information on observed and projected climate change impacts for the state. It provides detailed information for specific regions and economic sectors, and also addresses issues around climate and environmental justice vulnerabilities as well as climate hazards and resilient strategies, including nature-based solutions. There has been a tremendous community engagement effort in the creation of this plan and some of the other initiatives. I have participated in a few of the workshops; they have been great for creating synergies and turning results into actionable items.

North Carolina Office of Recovery and Resilience and North Carolina Resilient Coastal Communities Program:

Another outcome of the executive order and the Hurricane Florence event was the creation of the North Carolina office of Recovery and Resilience, a division of the North Carolina Department of Safety. It is headed by our state's first Chief Resilience Officer, Dr. Jessica Whitehead with a mission is to build a

stronger North Carolina where communities, economies, and ecosystems rebound, adapt, and thrive amid changing climate conditions and challenges. They are responsible for the distribution of post disaster relief funds, advising government agencies on disaster recovery and resilience, and providing technical assistance to communities seeking to implement resilience plans. This is a major initiative in partnership with the Division of Coastal Management; The newly created North Carolina Rural Center serves as the North Carolina Resilient Coastal Communities Program. The program is using 3.4 million in grant funding to work with 20 North Carolina coastal communities to conduct risk and vulnerability assessments. In order to prioritize and design resilience building projects construction funding will be provided. There are plans to expand this program to other parts of the state in the future.

Lumberton Community Resilience Plan Implementation

The Lumberton Community Floodprint is a community resilience plan that currently underway. This is the work of Andy Fox and the Coastal Dynamic Lab, which resides within the College of Design at NC State. The project was initiated following the devastating flooding that occurred as a result of Hurricanes Matthew in 2016 and Florence in 2018. This interdisciplinary project won an ASLA Award of Honor for Analysis and Planning and an Award of Excellence from the ASLA Southeast Regional Conference.

The City of Lumberton is located in the Southeast region of North Carolina, approximately 70 miles inland from the coast. It resides along the Lumber River, which meanders through the southern portion of the city and is a vital natural resource that is intrinsically tied to the Community's cultural identity. Both watershed scale and site-specific analysis led to the proposal of the Lumberton Loop. This greenway system knits together over eight and a half miles of trails across 806 acres of publicly accessible open space and vacant parcels, 99% of which are in the 100-year flood plain. The plan was formally adopted by the city. Just this week the North Carolina attorney general announced that Lumberton will receive a $250,000 Environmental Enhancement Grant to support the Floodprint's proposal to adapt and reuse a former meatpacking plant along the Lumberton Loop as a Watershed Education Center and boat launch.

SOUTH CAROLINA – Erin Stevens:

Charleston Comprehensive Plan:

I am going to focus on the area I know well - Charleston. I am going to give a brief overview of some work that we're currently doing with the city. Charleston is in the process of updating their comprehensive plan, which they have to do every 10 years. We were hired as part of the multidisciplinary team to analyze water issues as they relate to land use within the Charleston region, present our analysis, and make recommendations to the city to integrate water issues into their comprehensive plan and their future zoning code.

We analyzed current mean low low water, mean sea level, and mean high high water levels to show where current average high tide is. With three feet of sea level rise, a large part of our landmass will be in the floodplain. That is not a storm floodplain, but an everyday high tide floodplain. Consequently a huge part of

our research and our recommendations are how to adapt to this rising sea, while also making smart decisions about how we grow as a region.

If you're familiar with Charleston, you know that we are quite obsessed with the past. One thing that has been fascinating to me is that we are looking towards the future while doing this analysis. It is uncanny to see that our future is really almost identical to our past. Looking at a map from 1780, right after the Revolutionary War looks very similar to what we have when we map six feet of sea level rise. Much of what is happening is that natural systems are reclaiming the land that we filled and tried to barricade against rising waters. This is important to acknowledge because we need to look to nature to see how we can adapt. We can integrate future plans with these natural processes for more resilient and adaptable solutions rather than trying to respond with structural solutions.

Salt marsh is a huge part of the landscape in Charleston, or the coastline along Georgia, North Carolina, and South Carolina. It is also a huge part of our economy. We are a culinary city and we are a tourist city. The salt marsh estuary is a place for wildlife; it is where the crabs and the shrimp and the oysters that we are famous for come from. It's where people spend a lot of money to go on tours and kayak. It is also an incredibly important part of our protection from hurricanes, storm surge, and other natural disasters, because it absorbs so much the energy of these storms. We are also a very flat landscape so a small increase in sea level has a wide horizontal range.

We recommend that we do everything that we can to not only preserve a buffer along the salt marsh, but to vegetate it as much as we can. We have two main options. As the sea level rises, a lot of our current marsh is going to go extinct. It needs a balance of wet time and dry time. As the sea advances a lot of our salt marsh will be underwater for an extended period of time and will die out. We need to reserve land that is currently higher ground to provide a transition to the marsh ecosystem. This will protect the habitat for components of the Low Country ecology. Planting that buffer will allow the marsh to migrate.
It is also important that we manage the buffer. Many of the buffer plants will die as the salt marsh migrates. By planting the most flood tolerant species we can ensure that it will be habitat for as long as possible. Once trees in the buffer die, the dead wood does a good job of preventing erosion so that the marsh can establish.

Another related result is the emergence of freshwater wetlands due to sea level rise. As the saltwater moves inland, the freshwater actually floats on top of it because it is not as dense as the saltwater. Locations that have a really high water table and a low elevation form this freshwater lens, pockets of emergent freshwater wetlands. If we paved or built on these areas, we would create a potential flooding issue. If we identify these areas and allow them to naturalize, they become important habitat and also help prevent the flooding of our built environment in the future.

A lot of people jump to installing a bulkhead as soon as they see erosion as the sea level rises. If we take the bulkhead approach it creates a hard wall that the marsh cannot jump over. So in effect, the more that we install bulkheads, we reduce possibility that this crucial saltwater marsh ecosystem can survive and adapt. This is a strong illustration of why it is important that we look to nature based solutions where they make sense.

As we identify where different conditions exist, we also plan for both freshwater and saltwater wetlands. It is really important to identify and define the landscape typologies in this area. We have three natural landscape technologies in the low country that we have identified as most essential. The first is the Coastal Edge, which is the tidal area. The second is the Lowland Floodplain. This is where you have poorly draining soils with high water tables and low elevations. The third is the Upland Ridge, where we have our sand dunes and pine forests.

Part of our recommendations for the future is a comprehensive list of plants that do well in each of these conditions. It is important that we install plants that will not only survive in the current conditions, but also in expected future conditions

A fourth condition that we identified and developed a plant list for is Urban and Suburban Reforestation. which is a plant community for highly disturbed soils that are either compacted fill or other urban conditions. These are plants that can do well in current conditions while providing hydrological and habitat benefits in the future.

The next step involved working closely with the hydrologists on our team to look at a variety of water management measures for each landscape topology that we identified. We developed an understanding of how the hydrology functions in each typology. We then identified which water management measures mimic that natural system. We also identified the amenity and habitat value of each measure.

The last step is applying this to the specific geography of Charleston. An example is James Island, one of the five major regions of Charleston. We developed a transect of each of those major regions, looking at soil types, hydrologic conditions, and systems. We came up with the housing technologies that make sense for each of these conditions. These need to be adaptable houses that are on piers so that they can be moved inland as the tide comes up. Housing might also be elevated, and we also identified areas where the land is high enough to not be at risk from sea level rise. For each of these areas we identified stormwater management tools that make sense across the transect. This method makes the recommendations more visible to the community so that they can see how our big research ideas apply to the actual neighborhoods where they live.

GEORGIA – Alfie Vick

Tybee Island

Tybee Island is off the coast of Georgia. It is one of Georgia's few barrier island communities. They have been really progressive and thinking about climate adaptation. In 2016 they had adopted unanimously a sea level rise adaptation plan.

The island had breaks in the dune system for pedestrian and vehicular access points cut through the coastal dunes that had been there for decades. In 2017 Hurricane Irma hit the island. They found that during the hurricane the dunes actually held up and did a good job of protecting the community from the surge.

However, where they had these breaks in the dune the surge came in and caused tremendous flooding on the interior of the island.

The good news is I'm going to talk about a few examples here of climate adaptation and then about some things are going on in Georgia with climate mitigation as well.

Tybee Island thought about sea level rise adaptation after Hurricane Irma and how to use the island's green infrastructure to protect themselves. They worked on a major dune restoration effort that included renourishment, but also ways to eliminate the breaks in the dunes while accommodating the need to cross over to the beach while maintaining a continuous dune system along the entire island. They have now successfully completed the project and have reinforced dune vehicular crossings for emergency vehicles.

Georgia Coastal Marshlands Protection Act

On the other side of the island you have the saltmarsh, a pattern that is common on the Atlantic coast. I do want to acknowledge with pride that Georgia has a Coastal Marshland Protection Act that was established in 1970. Georgia has 100 miles of Atlantic coast that provides one third of the Atlantic's intact saltmarsh. This is largely due to protection from this Marshland Protection Act. This year was the 50th anniversary of the act. The act does a lot to protect the mainland. We benefit from that great green infrastructure.

Coastal Dry Day Flooding

Tybee Island is now thinking about what to do to address the sea level rise that is still happening. They are experiencing the inland dry day flooding that everyone's been talking about. They are now working with the University of Georgia Marine Extension, the College of Environment & Design, and the College of Engineering to address the issues. The only access to the island is a highway on a causeway to Tybee. This is not accessible during a hurricane or a storm surge but has been accessible during a king tide.

The team is working with the island to begin master planning and considering adaptation on the marsh side of the island, thinking about what kind of strategies might help alleviate dry day flooding due to sea level rise on some of these vulnerable properties. It is a complex process. Over the next 12 months we will be working with stakeholders on large community engagement in order to help them navigate the planning process.

Atlanta Storm Intensity

As an urban example of the impacts of climate change, Atlanta experienced a 500 year storm, then another 500 year storm, and then a 1,000 year storm occurring during a few months period. This made us come to terms with the fact that new precipitation patterns are happening.

In Atlanta neighborhoods were built in a low- lying area in the city that is very vulnerable to flooding. Infrastructure is exceeding its capacity when underwater. In one neighborhood a major rain event caused a terrible disaster. One of the responses has been that the city is acknowledging their role in needing to address the flooding issues in some of these communities.

Atlanta is already under a consent decree with the EPA to deal with our combined sewers. One of the engineering strategies has been to build massive underground detention vaults to store the stormwater and delay its discharge so it doesn't cause sewer overflows. One of these vaults was planned for the historic Fourth Ward at the cost of $40 million. Fortunately, some watershed advocates convinced the city to consider some alternatives. One is the use of Fourth Ward Park as a massive detention pond that would provide not only the ecosystem service of stormwater mitigation, but also recreation and habitat multifunctional benefits.

This park was built at a cost of $25 million so there was immediately a $15 million benefit by using this strategy. The park has generated over a billion dollars of private investment in the surrounding area as a result of the park amenity. The investment results in the responsibility to think about issues of gentrification and displacement of communities that need to be addressed with projects of this scale.

Georgia Climate Project

In Georgia there are some major statewide grassroots initiatives going on. These are consortiums of academic institutions and nonprofit foundations that are that are working to advance a more holistic approach to climate mitigation and adaptation in the state of Georgia. We already have a lot of great leadership at the city level and now we're looking to broaden the dialogue. The Georgia Climate Project is working to build a statewide network of climate advocates to figure out what to do about climate change.

Drawdown Georgia

One of the things they are doing is funding Drawdown Georgia, which is a mitigation effort. Drawdown Georgia is building off of the international Project Drawdown, looking at the most effective strategies to begin mitigating climate change. Granted, a state has a limited impact, but it certainly is an important impact. So we are looking at what are the strategies that could be best to utilized in the state of Georgia to mitigate ongoing climate change.

CLIMATE CHANGE LIBRARY PROJECT

The library project is very exciting. Please let us know if you have great projects or great policies about addressing climate change.

FLORIDA – Emily O'Mahoney

Florida has 1,300 miles of coastline. Three quarters of the population is on or near the coast. We have a population of 21 million. So that's a lot of people near the coast.

There have been on six laws and policies about climate change set since 2007. Interest was heavy in 2008 and then it was quiet for a long time. We did not even use the word climate change for a long period, but now the term has come back again. There are three state agency plans including one from Florida

Department of Transportation, one is a plan for reefs, and the third is the Florida Energy and Climate Action Plan implemented in 2008. There are also 15 policies and plans in place at the local and regional level.

Florida Energy and Climate Action Plan

The plan that has affected most cities is the Florida Energy and Climate Action Plan of 2008. A lot of cities have joined that. At the local and regional level, we have many Resiliency Directors, especially in the southeast and the southwest.

Another unique thing about Florida is that it has an aquifer system under almost all of the state. So we've been a little bit spoiled with our sufficient water and have not worried about it. Our municipalities draw water from the aquifer and pump other stuff back down. At the same time, with sea level rise we are getting saltwater intrusion in wells that are closest to the coast.

There is a high probability of hurricanes, particularly in the southeast and the panhandle gulf.

University of Miami Lakeside Village, Miami, Florida

Architectonic and ArchitectonicGEO designed dormitories at the University of Miami. Lakeside Village includes 25 buildings with sloped green roofs. They were custom designed to withstand our hurricane winds. A problem with green roofs in Florida is designing for scouring that affects the edges of the green roofs in high winds. These roofs were designed for 200 mile an hour winds. The roof is not accessible to residents but is designed to support pollinators and absorb water. In addition, the project was built using Low Impact Development principles and includes a pedestrian underbuilding activated ground plane.

Sunny Day Flooding

Landscape Architecture Magazine published an article about sunny-day flooding and other sea level rise issues and solutions in October of 2020 that included projects we are talking about today, "Miami's Next Wave" by Brian Barth.

Green vs. Gray Report, 2016, Miami Beach, Florida

This project by Savino & Miller is the conversion of a 19-acre golf course to a wetland to serve as stormwater retention and as Bayshore Park. The runoff is collected from 85 acres of the surrounding area.

Miami Baywalk & Riverwalk Design Guidelines

Savino Miller also developed Baywalk and Riverwalk Design Guidelines in Miami. They recommend a 25 foot wide path along the edge of the water. They looked at the edge conditions and developed different scenarios. The walk has been built so the water edge is already hardened. They considered connectivity and interpretation. There is a historic trail component with the concept for adjacent private development building a lot of the trail. The trail can go out into Biscayne Bay and provide access to mangrove habitat.

This project demonstrates the regulatory issues in developing living shorelines. Hardening the shoreline displaces seagrass, an issue along the Florida shore. A new policy has been adopted and is moving forward to retain the seagrass.

Barnacle Historic State Park, Coconut Grove, Florida

This project is a great example of retreat. The park is a five-acre historic property located on a narrow site that was given to the state to be improved as a museum. This historic house is the oldest in the City of Miami, built by the developer of Coral Gables and located along Biscayne Bay. The plan addresses issues of sea level rise and resiliency. While the main structure is protected, other structures on the site are built to be inundated as sea level rise occurs. By retreating from the current uses, the seagrasses can reestablish, providing important ecosystem services.

I believe that where Florida is moving relative to climate change is that all development and redevelopment will offset climate change directly and indirectly. Zoning codes will likely be the regulatory method to require that development be resilient and sustainable. We have a lot of big picture thinking going on right now and are putting policy in place. Now we all, from our individual homes on up, need to be a part of this change and do our share. So let's make a difference. I am hoping that is what this group will do.

Andrew Fox:
Thank you to all the panelists. It is really great to begin to move from defining issues to innovation and the beauty that that we are able to create as landscape architects in the face of really confounding and vexing challenges as the climate is changing and affecting our built and natural environments.

This initial regional discussion has been heavily focused on the coastal issues, given the composition of the panelists, where we live, and where we work. We recognize that when we talk about climate change and climate change impacts t there is a great range of other issues and other physiographies we have to contend with, such as mountains and piedmont, as well as both rural urban environments.

Emily ended our presentations by putting up some scales of how we think about climate change issues as individual consumers and how we vote with our dollars, as well as how we address climate change as practitioners, based on what we specify and how we design. We also address climate change issues through policy and planning as well as our advocacy role in the profession. We would like to hear from you about further issues we should be addressing as a regional committee on these issues. s.

Kona Gray:
All of these states have very important barrier islands that are at risk. Do you all have any thoughts about what we can do as a profession to protect these ecosystems? We have done a great job in Florida of ruining the barrier islands. I was sad to see that happen in other places.

Working with Communities

Alfie Vick:

One thing that's on the top of my mind is something our profession is uniquely skilled to do. That is to lead communities through a really comprehensive visioning process that that helps to educate them about the realities. Of course we need to partner with scientists and other experts to help us with the right data. We are the ones that help communities visualize potential scenarios, good and bad, that let them start to think about what kind of future they want. I like to see our students getting excited about their power to help communities, to take that that kind of ownership over their own futures. We can help guide communities to think about the possibilities of what their community can be. That is one of our greatest tools.

Emily O'Mahoney:
I really like that idea of taking the vision forward and really realizing what it means to us.

Collaboration with Scientists

Andrew Fox:
Building on that idea of visioning and generating scenarios, what are some thoughts about how we begin to engage more actively with the best available science and the scientific community? How do we bring together our ability to visualize some of the projections, and include the cost of doing nothing? Are there thoughts from the group about opportunities to use scientist's future scenarios collaborating in advocacy?

Stephanie Kelly:
In North Carolina, there are many initiatives and community engagement activities that are already happening through departments like in the interagency council who are doing great work. Landscape architects need to be part of these meetings representing the profession. Some of these collaborative initiatives are already taking place and having the voice of landscape architects present to help to guide the work while being careful to not be too internally focused.

Erin Stevens:
One thing that landscape architects are great at doing is expressing some complicated, complex scientific research in a way that the community can understand. We often work with engineers whose graphics make sense to people who are engineers, but they are often not legible and not understandable to others. They are not practical for the larger community. We can play a role as a profession by making overwhelming and confusing scientific data more accessible to the communities we work with.

Andrew Fox:
It is important to make information understandable in terms of legislative advocacy. Katie, please tell us about the ASLA activities around climate adaptation advocacy moving that discussion forward in a positive way.

Katie Riddle:

The ASLA, in addition to working on the federal level, is focusing on advocacy at the state or more local level and every year during the month of August. We encourage our chapter leadership to engage in an advocacy day at the state level, bringing issues specific to your states to educate your legislators on what benefits come from landscape architecture and the solutions that we offer to the issues that are at hand. There are some really great resources on the ASLA website for state level advocacy and I'm happy to connect you with our State Government Affairs Director, Elizabeth Hebron.

Emily O'Mahoney:
I find that at the state level, at least in Florida, a lot of chapters are very consumed these days with protecting the right to practice. I think we absolutely need to become more involved. Going to the legislators is not just advocacy but also explaining everything you do.

Education and Practitioner/Academic Collaboration

Andrew Fox:
Climate change and human health is important. And so many of the factors that we have touched on relate to the need for biodiversity.

There are some chat comments about the importance of education and educational materials to help the lay public and decision makers to better understand issues and solutions. I will put a plug in for the university programs out there. Some of the very best educators and communities are the students themselves, because they go out and are exploring ideas. They're incredibly ambitious for the social conscience and deeply committed to making positive change. We have found that in even highly charged conversations students are a huge mitigating factor. Folks will set down their differences and arms and have a conversation, because they know they are supporting a student who is in the process of learning and experimenting. I want to underscore how important it is for practitioners to participate in your local programs. Practitioners working with students is not a one way street. An amazing synergy is created when collaborating across our platforms, whether it be professional practice, academic faculty, educators, researchers, or the students. We have to find ways to come together around the issues and gain tremendous traction.

Kona Gray:
I'd like to know what's next for you.

Communities dealing with repetitive flooding – Database of Information Needed

Barry Miller:
We have a broad based profession. As we move forward, nationally and through the region it will be interesting to share information. We are working on a project along a river basin throughout Dade County, and we are kind of bucking up against the Army Corps. They prefer their grandiose giant wall projects, and there has been a lot of pushback on that approach. We need to figure out what other communities are doing

to address repetitive loss properties that are flooding over and over and over again; It would be great to get a database about this issue, as the sea level is coming up more.

We also need information on the policies that municipalities, states, and water management districts are using to address flooding due to sea level rise. Are they raising streets, raising houses, or retreating and turning former housing sites into open space? This is going to be a big issue in this particular river basin. There are also septic tank issues. How do communities get funding to deal with a lot of pollution with the ground level of water rising up in South Florida? Emily talked about the aquifer we have here. We have a very high water table and there was never a big issue septic tank pollution back into Biscayne Bay. It would be great as you move forward to create a database of what kind of tools we as practitioners can use. It goes a long way to show what folks over in South Carolina and over in Louisiana are doing. It would be helpful for people in the trenches.

Next Steps: Database of Precedent Projects, Issues, Organizations, Potential Partners

Andrew Fox:
The next steps of these discussions kicking this this regional effort off is for climate action leaders to work to populate databases of precedent projects. Those are model projects we can all aspire to. We need to identify great organizations that we can look to across state to state on certain topical issues. We need to identify and make accessible policies, programs, and funders, as well as potential partners and organizations. Interdisciplinary firms that are doing great work but are not necessarily landscape architectural firms are potential partners. The goal is for us to use the information from these conversations as we have them, extracting presented information and this feedback and begin to populate what the pressing issues are. We need to define how we share information and how to move the needle on it.

I would like to thank all of our panelists for all the great presentations and all the discussion today.

Katie Riddle:
Thanks, Andy, and thank you, Barry for that last question, because that was a really great way to wrap this up. Our national team is working with the Climate Action Committee and our expanded Climate Action Network to build out that clearing house and find the best way to push out the information to our membership, but also to collect the information from all of you on an ongoing basis. I hope that you have all taken away at least one piece of information that you can carry back to practice or research.