The Southeast Climate Adaptation Science Center (SE CASC) leads science and partnerships to understand climate impacts and inform adaptation efforts for fish, wildlife, ecosystems, and cultural resources. We place a strong emphasis on co-production of actionable science with Tribal, federal, and state managers. Through workshops, symposia, and working groups, we build communities of practice and share new science and tools with diverse audiences. To foster the next generation of climate professionals, we support a diverse and interdisciplinary cohort of graduate students through our Global Change Fellows program. The 2022 Southeast Climate Adaptation Science Symposium successfully brought all of these SE CASC research efforts together with our management partners.

The SE CASC, including Consortium and USGS scientists, continued to expand and develop new research projects, working group activities, and engagement with managers. This included formation of a working group to develop a Regional Invasive Species Climate Change network for the Southeast and enhancing efforts to assist partners with State Wildlife Action Plan revisions and species status assessments. Our tribal engagement strategy continues to be an important focus. Several significant research products were released, notably a dataset of projected future streamflow for the U.S. and a model of future patterns of urbanization.

University leadership engaged with several institutions to build on accomplishments to date and to envision the next phase of the SE CASC, developing a competitive proposal to continue as the university host for an expanded SE CASC Consortium, which is ramping up at the end of 2023. We invite you to connect with us as we continue our efforts to enable better climate-smart decisions in the changing landscapes of the Southeast.

— University Director, Rebecca Irwin and USGS Director, Katherine Smith

Our Mission
is to deliver science to help fish, wildlife, water, land, and people adapt to a changing climate.

Our Team

SE CASC STAFF
- RYAN BOYLES, USGS Deputy Director
- ELLEN BROWN, USGS Data Steward
- JENNIFER CARTWRIGHT, Science Coordinator
- STEPH COURTNEY, Assistant Tribal Climate Science Liaison
- MITCHELL EATON, USGS Research Ecologist
- KRISTEN FONTANA, Climate Science Translation and Communications Fellow
- CARI FURINESS, Program Manager, Assistant University Director
- REBECCA IRWIN, University Director
- ALEX LOOMIS, Rare Plant Climate Impacts Postdoctoral Fellow
- CATHERINE (KASIA) NIKIEL, Climate Impacts Postdoctoral Scholar
- HAILEY SHANOVICh, Climate Change and Wildlife Action Plan Fellow
- KATHERINE SMITH, USGS Director
- ADAM TERANDO, USGS Research Ecologist
- CASEY THORNBROUGH, Southeast & Northeast Tribal Climate Science Liaison
- PAUL ARMSWORTH, University of Tennessee
- WENDY GRAHAM, University of Florida
- JOHN KUPFER, University of South Carolina
- KAREN MCNEAL, Auburn University
- LYDIA OLANDEr, Duke University
- KRISTEN FONTANA, Climate Science Translation and Communications Fellow
- CARI FURINESS, Program Manager, Assistant University Director

UNIVERSITY PRINCIPAL INVESTIGATORS

THANK YOU!

We said farewell to several great SE CASC staff in 2022-23:
- ARANZAZU LASCURAIN, Assistant University Director [through Oct 22]
- BRITTANY SALMONS, Climate Science Translation and Communications Fellow [through May 23]
- MARIE SCHAEFER, Tribal Climate Strategies Research Scholar [through Sept 23]

Learn more about us at https://secasc.ncsu.edu/home/about/people/staff/
RECENTLY INITIATED SE CASC SCIENCE PROJECTS*

**PRIORITY 1–EXPOSURE**: Improve understanding of what climate and land use change processes and associated biophysical stressors will look like on the land and water they manage.

**PRIORITY 2–IMPACTS**: Improve understanding of ecosystem, habitat, and species impacts of climate and land use change, as well as the understanding of how these changes affect resources of specific concern to resource managers.

**PRIORITY 3–ADAPTATION**: Increase understanding of, and access to, practical guidance for framing and making smart climate and land use change adaptation decisions.

*Maps indicate project geography area, color indicates research priority. Learn more at secasc.ncsu.edu/science/.

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**CLIMATE CHANGE INTO STATE WILDLIFE ACTION PLANS (PAUL ARMSWORTH)**

*Convened regular calls of researchers from universities and USGS with partners from federal and state agencies, Tribal nations, and NGOs on topics including species of cultural concern to Tribes and identifying climate change refugia.*

*Presented data resources and training to partners on trait-based and niche model methods for estimating species vulnerability to climate change.*

*Organized a Science Café table at the SE CASC Science Symposium with staff from US FWS and NCASC.*

*Contributed to a session at 2023 SEAFWA meeting,* "Climate Services and Technical Support for State Fish and Wildlife Agencies."

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**SOUTHEAST CONSERVATION ADAPTATION STRATEGY (NILS PETERSON)**

*Attended monthly SECAS Steering Committee meetings and SE CASC Climate Change into SWAPs meetings, presenting wildlife conservation communication framing strategies and regional collaboration efforts.*

*Worked with the SECAS steering committee to carry out a survey of state field biologists focused on SWAPs, disease management, and efforts to improve DEI initiatives.*

*Supported a session at the 2022 SEAFWA Annual Meeting,* “SECAS: Applying the Southeast Conservation Blueprint across scales,” and contributed to a 2023 SEAFWA session,

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**ECOSYSTEM SERVICES AND GLOBAL CHANGE (LYDIA OLANDER)**

*Updated southeast ecosystem accounts with new data to add years 2013, 2016, and 2019.*

*Wrote guide for state natural & working lands planning based on recent work with North Carolina.*

*Developed two online tools for North Carolina conservation planning and benefits reporting.*

*Initiated work on a framework for use of nature-based solutions for DOI agencies.*

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**SOEAST REGIONAL INVASIVE SPECIES AND CLIMATE CHANGE MANAGEMENT NETWORK (BRET SCHEFFERS)**

*Developed a session on biological invasions in the SE at the SE CASC Science Symposium and hosted a Science Café table to engage partners in the network.*

*Organized a workshop to elicit stakeholder feedback for the network.*

*Hosted informational webinars and implemented a survey of managers and researchers in invasion science.*

*Contributed to synthesis research of the cross-RISCC network.*

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**WATER SUPPLY AND DEMAND IN A CHANGING CLIMATE (WENDY GRAHAM)**

*Hosted two webinars: Impacts of Extreme Weather & Climate on Florida Water Agencies (Oct 2022) and Future Rainfall Projections for Florida Water Resources Planning and Management: Stakeholder Needs Assessment (Mar 2023).*

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**EVALUATION OF ACTIONABLE SCIENCE (PAUL ARMSWORTH, KAREN MCNEAL)**

*Facilitated monthly calls of researchers interested in how to evaluate actionable science and contributed to a synthesis paper on lessons learned across the CASC network.*

*Hosted a session on evaluating actionable science at the SE CASC Science Symposium.*


* Working Groups bring together multidisciplinary, multi-organizational teams to address regionally-relevant emerging issues and improve co-production. Learn more: secasc.ncsu.edu/science/working-groups/.

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**WORKING GROUPS**

- Characterizing Climate Change Impacts on Species Status Assessments
- Accounting for Ecological Impacts of Climate Change in State Wildlife Action Plans: A Comparison of Model-Based and Index-Based Vulnerability Assessments
- Integrating Sea Level Rise Scenarios into Everglades Restoration Planning
- Climate Impacts on Rare-plant Biodiversity in the Southeastern U.S.
- Developing a Cave Conservation Management Toolbox by Exploring Cave Microclimates and Biodiversity Patterns
- Examining Diverse Management Objectives and Broadening Stakeholder Engagement for Climate Adaptation Planning of Historic Structures Within the National Park System
- Informing Climate-Adaptive Forest Management for Breeding Bird Habitat in the Southern Appalachians
- Advancing Climate Change Adaptation Strategies for Sensitive Amphibian Species in the U.S. Caribbean
- Future of Aquatic Flows: Exploring Changes in the Freshwater/Saltwater Interface and Related Impacts to Aquatic Species

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**52 new publications in 2022-23**

[secasc.ncsu.edu/publications/journal-articles-and-reports/]

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**PAGE 2**
Supervisor, US FWS
be protected from potentially toxic levels of salinity.

Support species recovery, such as translocation or reintroduction to sites where animals will sessations or listing decisions for mussels, and selecting appropriate sites for activities that work in the US Fish and Wildlife Service, such as threat analysis in Species Status As

IMPACT
Don't develop into adults and add to existing populations.

A critical reproductive bottleneck; if larvae cannot survive at these concentrations then they
to sea salt, especially in populations that had no previous salinity exposure. This represents

PROJECT RESULTS: Research with partners VA Dept of Wildlife Resources, NC Wildlife Resources Commission, and US FWS showed that larvae were the life stage most sensitive to sea salt, especially in populations that had no previous salinity exposure. This represents a critical reproductive bottleneck; if larvae cannot survive at these concentrations then they don't develop into adults and add to existing populations.

IMPACT: This research provides valuable insight on the growing threat of sea level rise and other sources of salinity to imperiled mussels. These findings inform multiple aspects of work in the US Fish and Wildlife Service, such as threat analysis in Species Status Assessments or listing decisions for mussels, and selecting appropriate sites for activities that support species recovery, such as translocation or reintroduction to sites where animals will be protected from potentially toxic levels of salinity. A new cohort of 12 students began their term in fall 2023.

Global Change Fellows produced 20 publications from their research since our last report, including:

• Awasthi, C, et al. 2022 | Projecting Flood Frequency Curves Under Near-Term Climate Change
• McQuillan et al. 2022 | Forest water use is increasingly decoupled from water availability even during severe drought.
• Montefiore, LR, et al 2023 | Vulnerability of Estuarine Systems in the Contiguous United States to Water Quality Change Under Future Climate and Land-Use

The Global Change Fellows developed a variety of media products such as blog posts, videos, story maps, and fact sheets on diverse topics related to their research interests. We created a short video celebrating ten years of the Global Change Fellows program. go.ncsu.edu/global-change-fellows.

My favorite part of being a Global Change Fellow is meeting the diversity of people all working toward the same goal. Connecting with professionals in other disciplines is so important for tackling an issue as large as climate change, as well as for challenging me to think outside the box on my own research.”

MURRY BURGESS, 2022-2023 FELLOW
2022 SOUTHEAST CLIMATE ADAPTATION SCIENCE SYMPOSIUM

The Symposium took place in Gulf Shores, AL, Sept. 19-21, 2022. This signature event provided a venue for researchers, managers, and others to share information about research products, management needs, and potential areas of collaboration. 164 researchers and managers working in the southeastern U.S. and U.S. Caribbean participated, including decision makers and practitioners from state fish and wildlife agencies, federal organizations, Tribal Nations, and NGOs involved with climate impacts and adaptation for fish, wildlife, habitat, and cultural resources in the Southeast. We developed a comprehensive Symposium Summary detailing key findings from presentations and discussions. secasc.ncsu.edu/2022-secasc-science-symposium/

SEAFWA ANNUAL CONFERENCE

We partnered with USFWS at the 2022 Southeastern Association of Fish and Wildlife Agencies annual meeting to present on work to improve collaborative conservation efforts. SE CASC and Consortium staff will participate in the 2023 conference, playing a role in organizing and presenting in four sessions.

DEEP SOUTH CENTER FOR ENVIRONMENTAL JUSTICE

We partnered with DSCEJ to involve their staff as plenary presenters at our SE CASC Science Symposium. SE CASC and USGS jointly sponsored the 8th Annual HBCU Climate Change Conference in April 2022; we promoted our science and Fellows program as well as supported travel of CASC Fellows. Our participation led to a new partnership with the University of Virgin Islands. We will participate in the 9th Annual Conference in Oct. 2023; USGS supported several CASC Fellows to present their research, including two SE CASC Global Change Fellows.

NATIONAL ADAPTATION FORUM

SE CASC staff presented in several CASC-organized sessions at NAF in fall 2022, “Approaches to Co-Producing Science for Natural Resource Adaptation” and “Innovative Communications to Improve Natural Resource Adaptation to Climate Change.” We also participated in meetings to improve program coordination with other federal-university organizations.

CARIBBEAN COMMUNITY OF PRACTICE

We collaborated with USFWS to organize the first in-person convening of this group of conservation practitioners from state, territorial, federal, and community partners working in the US Caribbean. We’ll continue to support this community to strengthen existing and facilitate future collaborations in Puerto Rico and USVI.

TRIBAL PARTNERSHIPS

SE CASC staff participated in the 2022 National Tribal and Indigenous Climate Conference, organizing and presenting a session, “Advance science through collaborations that bring Indigenous and Earth sciences into partnership.” We were sponsors to the 2023 AISES Conference, an opportunity to share the work and opportunities of SE CASC and to recruit Native students into SE CASC programs. Tribal environmental staff join monthly calls of the Climate Change into SWAPs WG, including representatives from the Native American Fish and Wildlife Society. Tribal managers presented in many plenary and breakout sessions at our Science Symposium; we also hosted a discussion of Tribal science priorities with Tribal representatives and SE CASC leadership and implemented a session on ethical Tribal engagement.

SCIENCE SEMINARS

We continue to implement Fellows-led Global Change Seminars via Zoom and in person as well as our staff-led virtual Science Seminar Series. We attract registrants from federal agencies, Tribal nations, state and local agencies, universities, NGOs, and community members, with our monthly newsletter a big driver of participation. We are coordinating with contributors to organize a seminar series on the Fifth National Climate Assessment.

NEW LOGO

SE CASC staff worked with a talented creative team, which included a former Global Change Fellow, to develop a new logo that is uniquely representative of our southeastern context and complementary to other CASC regional logos.

Looking Forward

NC State University engaged with several institutions to build on these and other accomplishments and to envision the next phase of the SE CASC, developing a competitive proposal to serve as the university host for the SE CASC Consortium for the next 5-year cycle. We enlarged our Consortium to incorporate access to expertise in specific areas of our footprint and to enhance connections with Tribal and other underserved communities. Learn more about the next phase at go.ncsu.edu/secasc-host-award.

Stay in touch!

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