



THE CITADEL

JAMES B. NEAR CENTER FOR
CLIMATE STUDIES

**ANNUAL REPORT
2023-24**

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EXECUTIVE SUMMARY

2023-24 marked the fourth year of the Lt. Col. James B. Near, Jr., USAF, '77 Center for Climate Studies (NCCS). Strategic initiative 6.3 of Our Mighty Citadel 2026 was revised to: “Establish the Near Center for Climate Studies as a Center for Excellence”. Towards this end the NCCS:

1. Was officially established with a symposium and ribbon cutting ceremony on September 15, 2023 (page 5)
2. Was awarded a NOAA National Sea Grant and Disaster Preparedness Program grant “Kids Teaching Flood Resilience: Step Up! Get Ready! Respond!” which furthers engagement with Charleston County youth and teachers (page 11)
3. Was awarded a SC Sea Grant Consortium project “Climate Action Engagement Academy for Minority and Women Owned Small Businesses: Fostering Economic Empowerment in the Midst of the Evolving Environment” which partners with the Tommy & Victoria Baker School of Business (page 16)
4. Was awarded a Boeing-Citadel partner grant to build up the Citadel Climate Monitoring and Assessment Program with a Davis Vantage Pro2 weather station (page 16)
5. Prioritized the climate and national security directive with new Advisory Board members and strategic planning (page 6)
6. Awarded \$28,633 in climate studies research to faculty in Chemistry, Mechanical Engineering, and Physics (page 12)
7. Added climate scholarship with 3 journal articles and 14 conference presentations and proceedings (page 12)
8. Won \$168,164 in external research proposals (page 15)
9. Was provided a Senior Climate Fellow position (page 17)

Due to the generous donations of Near family members, the NCCS was able to bridge some of its funding shortfalls. The Climatological Research Studies Grant competition was reinstated, although the amount awarded was a record low. NCCS continues to engage with key climate stakeholders locally and nationally, especially through its work on heat health threats, and has partnered with TCF to enlist industry champions. The addition of a Senior Climate Fellow with dedicated time to the Center will advance the goal of NCCS becoming a Center of Excellence.

Scott Curtis, Ph.D., Director

Near Center for Climate Studies

VISION & MISSION

The NCCS serves the students and faculty of The Citadel and citizens of South Carolina by enhancing understanding of climate and its variability, change, and risks. The vision of the Center begins with the personal vision of Lt. Col. Jim Near. Near served twenty years in the USAF as a meteorologist and in fall 2014 returned to The Citadel as an adjunct professor of Physics. Near demonstrated extraordinary generosity by providing The Citadel Foundation (TCF) with a \$3.27 million gift to initiate the Center. Ever humble and not wanting to receive any recognition for his donation, he specified to TCF that his gift remain completely anonymous until his passing in March 2020.

Vision

The Lt Col James B. Near, Jr., USAF, '77 Center for Climate Studies will be nationally recognized as an academic leader in *climate science*¹ and facilitating the transition of this science from research into operational use to assist in principled decision making.

Mission

The NCCS mission is to promote climate science through education, research, transition to operations and community engagement and the development of public-private partnerships. The scope of the Center's activities will consist of the relation of Earth's climate to (a) national security, (b) coastal environment and infrastructure, and (c) human health and welfare.



1. climate science is defined as the science of how global, regional, or local climates are maintained and change over time and their effects on the environment and society.

NEAR CENTER

The NCCS was officially established and dedicated on September 15, 2023. The day began in the Swain Boating Center with a public science panel by Ms. Sherri Goodman, Mr. Tim Smith, and Dr. Geoff Scott (bios can be found in Appendix C). In attendance was Jim Near's son, daughter, and one sister. Mayor Tecklenburg (Charleston) and Mayor Haynie (Mount Pleasant) joined the celebration. The panel was followed by a ribbon cutting ceremony led by President Walters, Provost Selden, BOV member Col. Love, Dr. Zimmerman, Dr. Curtis, and Mr. Houck. A plaque commemorating the vision and leadership of Lt. Col. Near was also unveiled. The full program is given in Appendix A.



The Center continues to be used in a variety of ways:

- SC Space Grant Annual Meeting
- Richland County District 2 ALERT Program: Wind and Turbines Activity
- Fall and Spring Climate Fellows Meetings and Executive Committee Meetings
- Physics Research Experience for High School Students
- Accepted Students Day

PERSONNEL

The NCCS is comprised of an Executive Committee, Advisory Board, and Climate Fellows. Going forward the NCCS will attempt to offer networking opportunities between the Advisory Board and Climate Fellows.

Executive Committee

The Executive Committee (EC) is made up of Citadel leadership and has oversight of NCCS activities as they pertain to the fulfillment of the NCCS Charter. There was no change in the Executive Committee

- Dr. Darin Zimmerman (chair), Dean of Swain Family School of Science and Mathematics
- Dr. Kevin Bower, Associate Provost for Academic Affairs and Dean of General Studies
- Dr. Scott Curtis, Director of Near Center for Climate Studies
- Dr. John Weinstein, Professor of Biology and Assistant Provost for Research
- Dr. Andrew Williams, Dean of Engineering
- Dr. Hank Yochum, Head of Department of Physics

Advisory Board

The Advisory Board (AB) is comprised of experts in the areas of environmental, climate, oceanic, atmospheric, and other closely allied sciences. Members may also include educators, policymakers, and leaders of the community and industry whose skills and activities would inform the Executive Committee on Center activities and direction, as well as provide networking opportunities for students and Center Fellows. Two members of the AB stepped down: Ms. Albany Irick and Mr. Joe Coates. Two new members were added: Gen Will Grimsley and Mr. Tim Smith. Dr. Fred Holland continues to serve as the chair of the AB. During the 2023-24 academic year the AB added a new committee on climate and national security, which has been elevated to a priority in the latest strategic planning update. The current committee membership is as follows:

- **Strategic and Governance (oversight of membership and committees):**
 - Mr. David Johnston (chair), Hamilton Advisors LLC
 - Dr. Fred Holland '64, former Director of NOAA Hollings Marine Laboratory
 - Dr. Susan Lovelace, SC Sea Grant Consortium
- **Outreach and Engagement Committee:**
 - Dr. Mike Johns '72 (chair), Windward Environmental LLC
 - Mr. Chris Mack, Moffatt & Nichol
 - Dr. Susan Lovelace, SC Sea Grant Consortium
 - Ms. Debra Hernandez, Southeast Coastal Ocean Observing Regional Association
 - Mr. Kevin Cooley '90, National Oceanic and Atmospheric Administration (NOAA)

- **Internship Committee:**
 - Dr. Hope Mizzell (chair), SC State Climate Office
 - Dr. Fred Holland '64, former Director of NOAA Hollings Marine Laboratory
 - Mr. Allan Clum, Mount Pleasant Waterworks
- **Resources & Development Committee:**
 - Col. Allison Dean-Love, CGC '93 (chair), Citadel Board of Visitors, *ex officio*
 - Mr. David Johnston, Hamilton Advisors LLC
- **Human Health & Welfare Committee:**
 - Dr. Paul Sandifer (chair), College of Charleston
 - Dr. Geoff Scott, University of South Carolina
 - Dr. Kirstin Dow, University of South Carolina
 - Dr. Brandon Emery, Lexington Medical Center
- **National Security Committee:**
 - Mr. David Johnston (chair), Hamilton Advisors LLC
 - Mr. Kevin Cooley, '90, National Oceanic and Atmospheric Administration (NOAA)
 - Gen Will Grimsley, SC Secretary of the Department of Veterans' Affairs (retired)
 - Lt Col Tim Smith, Chief, Operations Integration Branch, Response Operations Division, FEMA (retired)

Two Advisory Board meetings were held, one on 9/15/23 and one on 3/21/24. Minutes of these meetings can be found in Appendix B.

Climate Fellows

At the close of the 2023-24 academic year there were 27 faculty and 3 community fellows of the NCCS representing all five Schools at The Citadel and the Department of Leadership Studies.

- Senior Climate Fellow (began June 1, 2024: see page 17)
 - Dr. Tess Doeffinger, Civil and Environmental Engineering
- Climate Fellow
 - Dr. Jen Albert, Education
 - Dr. Mostafa Batouli, Civil and Environmental Engineering
 - Dr. Holly Bevsek, Chemistry
 - Dr. Kweku Brown, Civil and Environmental Engineering
 - Dr. Mei Chen, Mathematics
 - Dr. Dung Do, Chemistry
 - Dr. Sean Fourney, Public Speaking Lab Director, Leadership Studies
 - Dr. Simon Ghanat, Civil and Environmental Engineering
 - Dr. Chao Gu, Mathematics
 - Dr. Danny Gustafson, Biology
 - Dr. Deepti Joshi, Cyber and Computer Science
 - Dr. Kaelyn Leake, Physics
 - Dr. Thad Le-Vasicek, Chemistry

- Dr. Bo Li, Mathematics
- Dr. Clinton Moran, Biology
- Dr. Amanda Mushal, History
- Dr. Mark Owens, Political Science
- Dr. Sergey Ponomarov, Marketing Supply Chain & Economics
- Dr. Deirdre Ragan, Mechanical Engineering
- Dr. Claudia Rocha, Biology
- Dr. John Sanders, Mechanical Engineering
- Dr. Nahid Vesali, Engineering Leadership & Program Management
- Dr. John Weinstein, Biology
- Dr. Gabriel Williams, Physics
- Dr. Todd Wittman, Mathematics
- Dr. John Zardus, Biology
- Dr. Lisa Zuraw, Chemistry
- Community Fellows
 - Dr. Merrie Koester, USC Center for Science Education
 - Dr. LJ Palmer-Moloney, Visual Teaching Technologies
 - Mr. James Ward, College of Charleston (emeritus)
- Student Fellows
 - The following student was bestowed the title in 2023-24: *Meredith Reed*

There were two meetings of the Climate Fellows, one on 10/09/23 and one on 4/4/24. Fellows were updated on Center activities and reports of the four standing committees were given. The four standing committees are: Academic, Research, Engagement, and Industry. The membership and goals are given below.

Academic Committee

Comprised of Fellows: Simon Ghanat, Lisa Zuraw, and Jen Albert. The charge of the Academic Committee is to propose educational and training opportunities for Citadel students and external constituents through curricular offerings, seminars and workshops, symposia, and continuing education. The committee will also engage with K-12 students and faculty.

Research Committee

Comprised of Fellows: Deepti Joshi, Clinton Moran, Mostafa Batouli, Sergey Ponomarov, and Gabriel Williams. The charge of the Research Committee is to seek research strategies and communicate external funding opportunities to the Director. They will also review internal research proposals, including the annual Climatological Research Studies Grant (CRSG) competition. Other Faculty Fellows may be invited to serve as reviewers in case of conflict of interest and/or a low committee membership. The committee will promote ethical behavior in the practice of research and innovative problem solving in climate science.

Engagement Committee

Comprised of Fellows: Kaelyn Leake, Deirdre Ragan, Claudia Rocha, Thad Le-Vasicek, and James Ward. The charge of the committee is to facilitate NCCS outreach to the community (individuals, groups) in climate science and related environmental disciplines. The committee will listen to climate stakeholders and seek ways the Center can provide expertise and principled science-based leadership.

Industry Committee

Comprised of Fellows: Nahid Vesali, Sergey Ponomarov, and Mark Owens. The charge of the committee is to establish industry partnerships that benefit NCCS partners and provide research, internship, and other development opportunities for Citadel students and Fellows. The committee will provide mentoring and network opportunities for students interested in climate-related careers.

STRATEGIC ACTIVITIES

Academics

- “Develop a minor around Climate Studies” (complete)
 - Although this action item is complete, the NCCS continues to monitor course offerings and enrollment and track the number of students declaring the minor “Climate Resiliency and Environmental Sustainability Studies (CRESS)”. As of 5/8/2024 two students had declared the minor. The three core courses for the CRESS minor are BIOL 209/NTSS 305: Environmental Science, PHYS 343: Applied Climatology, and a Capstone Course. Environmental Science and Applied Climatology were both not offered during the 2023-24 academic year. Below is a table of a few additional climate related courses. There does not appear to be a positive trajectory in course enrollment. This trend is concerning and will be presented to the Academic Committee.

Number	Title	# Fall 2020	# Spring 2021	# Fall 2021	# Spring 2022	# Fall 2022	# Spring 2023	# Fall 2023	# Spring 2024
BIOL 209/ NTSS 305	Environmental Science	47	NA	36	NA	NA	NA	NA	NA
PHYS 343	Applied Climatology	NA	NA	NA	NA	NA	3	NA	NA
PHYS 244/ NTSS 305	Extreme Weather and Climate	NA	12	13	NA	NA	NA	23	17
NTSS 301	Technical Solutions to Climate Change	NA	NA	14	24	NA	19	NA	NA
NTSS 303	Biology, Environment, and Law	16	49	24	38	11	10	16	16
CIVL 322*	Intro to Env. Engineering	NA	49	NA	37	NA	33	NA	36
Freshman seminars	Environmental Hazards	23	21	21	20	18	20	17	NA
TOTAL		86	131	108	119	29	85	56	69

* An elective course in the CRESS minor

- A new Sustainability Strand course HISS 305 was offered by Climate Fellow Amanda Mushal in Spring 2024. In “Changing American Landscapes” students explore changing interactions between American society and the natural world, from pre-

contact through the 21st century. From hunting practices to water management, changing agricultural techniques to urban planning, the course explores how have people shaped the landscape and environment around them, and how have they been shaped by it

- The NCCS, in partnership with The Center for Excellence and Innovation in Teaching, presented its third “Active Learning: Infusing Climate Effects into your Curriculum” on March 26, 2024. This workshop was led by Climate Fellow, Dr. Simon Ghanat and attended by ~10 faculty. It was the first time the faculty enrichment activity was held in the Climate Center and included lunch.



- “Develop a teacher workshop on infusing climate into the K-12 curriculum”
 - During the 2023-24 academic year the NCCS was funded **\$88,664** from a total of \$159,934 by NOAA National Sea Grant and Disaster Preparedness Program for the project: “Kids Teaching Flood Resilience: Step Up! Get Ready! Respond!” This was in partnership with SC Sea Grant Consortium (lead), The Citadel’s STEM Center of Excellence, and Kids Teaching Flood Resilience (KTFR). Dr. Merrie Koester, Climate Fellow, has been paid to design, develop and field test a series of KTFR lessons, activities and artifacts. She has worked with Teacher Leaders and Thought Leaders on hurricane and water safety. The research team is preparing for a “Camp Flood Resilience” in September 2024.

Takeaways

In the 2023-24 academic year the NCCS began advertising and tracking the CRESS minor. Due to an oversight, the revised minor was not in the official catalog until December 2023. The structure of the minor will be revisited in the fall by the Academic Committee in conjunction with the Director. Climate Fellow Dr. Ghanat led a third active learning workshop for Citadel faculty.

Research

- “Enhance research in Climate Studies”
 - Funding from the Center to faculty and students
 - The Climatological Research Studies Grant (CRSG) program is administered through the NCCS and funds Citadel faculty and students in climate studies. Due to generous donations by members of the Near family, the CRSG was fully funded in the 2023-24 academic year. However, a new action of “increasing funding for operational support, particularly for climate-related research” was added. The Director is working with Bobby Houck and Page Tisdale to identify donors/corporations that may want to support the CRSG or symposium speakers (see outreach & engagement). Like last academic year there were only three CRSG projects awarded and the total of \$28,633 was the least amount ever funded by the program, well below the target of \$40,000.

Last name	First name	Dept.	Amount	Title
Do	Dung	Chemistry	\$10,574	Green oxidation of C-H bonds: A conceptual blueprint for an alternative utilization of methane and fossil fuels
Sanders	John	Mechanical Engineering	\$12,000	Toward more accurate and reliable weather predictions via progress on the Navier-Stokes problem
Williams	Gabriel	Physics	\$6,059	The Structure and Evolution of the Boundary Layer for Landfalling Tropical Cyclones

- Publications, technical reports, undergraduate research projects, or conference proceedings per year. There was a total of 3 journal articles, 14 conference papers and national and international conference presentations, and 5 student presentations at The Citadel.

Journal Article

- Ertel, B. M., Weinstein, J. E., Gray, A. D. 2023. Rising seas and roadway debris: Microplastic and low-density tire wear particles in street-associated tidal floodwater. *Marine Pollution Bulletin*, 195, 115502.
- Mukherji, A., K.N. Adeniji, S. Curtis, J. Helgeson, J. Kruse, and M. Millea, 2024: Buyout programme experiences and perspectives of local public officials in eastern North Carolina. *Environmental Hazards*, doi:10.1080/17477891.2023.2299371.

- Mukherji, A., K.N. Adeniji, S. Curtis, J. Helgeson, J. Kruse, and A. Ghosh, 2023: Perspectives of local public officials on the health hazards of compound flooding in eastern North Carolina. *SSM - Qualitative Research in Health*, 4, 100359, <https://doi.org/10.1016/j.ssmqr.2023.100359>.

Presentation / Conference Proceeding

- Becker, E. T., Inman, D. J., and Sanders, J. W., 2024. "On the improved efficiency of higher-order dynamics for computing resonant frequencies". In Proceedings of the ASME 2024 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC-CIE). Accepted, in press.
- Curtis, S., 2024. "Charleston Heat Health Index", SC7 Resiliency Conference, Isle of Palms, SC (joint w/ Dr. Dulaney Wilson and Dr. Amanda Guthrie)
- Curtis, S., Palmer-Moloney, L.J., Bird, Z., Riggle, R., and Jessen, B., 2024. "Climate Action Engagement Academy for Minority and Women Owned Small Businesses: Fostering Economic Empowerment in the Midst of the Evolving Environment", SC Sea Grant Consortium Research Symposium, Conway, SC.
- Curtis, S., Guthrie, A., Fish, E., and Redmond, J., 2024. "Field testing PlusTi road penetrants for urban heat island mitigation in under-resourced neighborhoods", 2024 Annual Meeting of the American Meteorological Society, Baltimore, MD.
- Fisher, S., Moran, C.J., Zardus, J.D., 2024. "Temperature impacts on feeding kinematics in the striped barnacle". Society for Integrative and Comparative Biology. Seattle, WA.
- Milling, R., Ghanat, S., Curtis, S., 2023. "Urban Heat Islands; Empirical Modeling and Wet Bulb Globe Temperature Analysis" poster was presented at Southern Conference Research Forum at Wofford University, Spartanburg, SC.
- Milling, R., Ghanat, S., Curtis, S., 2024. "Urban Heat Islands; Empirical Modeling and Wet Bulb Globe Temperature Analysis" presented at ASCE-SC Eastern Branch April 2024 meeting, Charleston, SC.
- Norton, D., Weinstein, J.E., Barr, J., 2023. "Assessing environmental fate of floodwater-associated tire wear particles along roadway-salt marsh interfaces." 44th Annual Meeting, Society of Environmental Toxicology and Chemistry - North America. Louisville, KY.
- Norton, D., Weinstein, J.E., 2024. "Microplastics in Roadway Adjacent Salt Marsh Sediments: An Unexpected Find". Microplastics in the Coastal Region Conference. Charleston, SC. (*this presentation won Best Oral Presentation*)

- Norton, D., Weinstein, J.E., 2024. "Shrimp and Grits: Tire and Road Wear Particle Effects on Gut Retention Time and Inflammation". Annual Meeting - Carolinas Society of Environmental Toxicology and Chemistry. Boone, NC.
- Sanders, J. W., Becker, E. T., and DeVoria, A. C., 2024. "Extension of Hamiltonian mechanics to non-conservative systems". In Proceedings of the ASME 2024 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC-CIE). Accepted, in press.
- Schmitz, L., Moran, C.J., Zardus, J.D., 2023. "Temperature effects on larval swimming of an important biofouling barnacle". Society for Integrative and Comparative Biology. Austin, TX.
- Schmuck, M.E., DiSilvestro, M.C., and Gustafson, D.J., 2024. "Low-tech seed enhancement technology could improve germination and establishment of Longleaf Pine understory Perennial Forbs". Association of Southeastern Biologists annual meeting, Chattanooga, TN.
- Tactuck, O., Ghanat, S., 2024. "Urban Garden Sustainability-Oasis Verde" poster was presented at 2024 ASEE-SE Conference, Marietta, GA.

Student Presentation - SURE Research Symposium, Citadel Academy of Science and Math (CASM) Annual Awards Banquet, and Academic Excellence Day

- Fisher, Savannah, Moran, C.J., Zardus, J.D. 2024. Temperature impacts on feeding kinematics in the striped barnacle. CASM Banquet.
 - Fisher, Savannah, Moran, C.J., Zardus, J.D. 2024. Temperature impacts on feeding kinematics in the striped barnacle. The Citadel Student Excellence Day.
 - Reynolds, Z. Rion, Moran, C.J., Zardus, J.D. 2023. Barnacles in hot water: temperature impacts on barnacle feeding. CASM Banquet.
 - Reynolds, Z. Rion, Moran, C.J., Zardus, J.D. 2023. Barnacles in hot water: temperature impacts on barnacle feeding. The Citadel Student Excellence Day.
 - Richard Milling (Ghanat): Urban Heat Islands: Empirical Modeling and Wet Bulb Globe Temperature Analysis. The Citadel SURE Research Symposium.
- Proposals for external funding per year. As of June 4, 2024 two proposals are pending and two funded.

Title	Citadel PI	Program	Funded?	Extent	Direct Funds	F&A
Kids Teaching Flood Resilience: Step Up! Get Ready! Respond!	Scott Curtis	National Sea Grant	FUNDED	9/1/2023-8/31/2025	\$86,750	\$1,914
Climate Action Engagement Academy for Minority and Women Owned Small Businesses: Fostering Economic Empowerment in the Midst of the Evolving Environment	Scott Curtis	SC Sea Grant Consortium	FUNDED	2/1/2024-1/13/2026	\$78,300	\$0
Risks, Impacts, & Strategies for Coastal Communities (RISCC)	Scott Curtis	NSF EPSCoR	PENDING	1/1/2025-12/31/2028	\$94,822 (\$6 million total)	\$21,359
Hydro-Social Monitoring for Adaptation, Resilience, and Transformation (Hydro-SMART) in the Caribbean	Scott Curtis	NOAA AdSci	PENDING	9/1/2024-8/31/2026	\$55,324 (\$299,849 total)	\$6,308

Takeaways

It was a successful year for climate research at The Citadel. Two proposals were funded totaling \$168,164 and two proposals are pending totaling \$150,146. Research was conducted and disseminated by many students and faculty. Efforts to endow the CRSG have branched in new directions with assistance from TCF.

Engagement & Industry

- “Develop a symposium series on relevant climate topics”
 - As mentioned previously, the NCCS hosted a panel of renowned climate experts as part of the grand opening on September 15, 2023. Biographies of the speakers can be found in Appendix C. Thanks to the efforts of Dr. Holland, The Citadel’s Krause Center is in the process of negotiating a Greater Issues talk by RADM David Titley on climate change and national security. RADM Titley holds a Bachelor of Science in meteorology from the Pennsylvania State University. At the Naval Postgraduate School, he earned a Master of Science in meteorology and physical oceanography, and a Ph.D. in meteorology. He was elected a Fellow of the American Meteorological Society in 2009. He served as a naval officer for 32 years and rose to the rank of Rear Admiral. Dr. Titley’s career included duties as Oceanographer and Navigator of the Navy and Deputy Assistant Chief of Naval Operations for Information Dominance. The Health &

Wellness Committee and the Climate Fellows Engagement Committee are exploring other symposium speakers. A list of potential speakers is given in Appendix D.

- “Develop a summer camp on climate information and communication”
 - This action has not been taken yet, but the NCCS was successful in securing a grant from SC Sea Grant’s biennial call for research proposals (see Table on page 15). With the funds the team will (1) co-produce a Climate Action Engagement Academy (CAEA) with a working group of small business leaders; (2) assess the value of a “community of practice” with CAEA participants; (3) assess the value of climate action and contingency plans with CAEA participants. While this is not a summer camp (CAEA will likely take place over two days in 2025), we will determine, with the working group, the best means of sustaining the Academy beyond the initial Sea Grant investment. It could be self-supported (franchised) with a sliding fee structure depending on the profit margin of the business, or through funds from a federal agency, such as NOAA.
- “Increase operational support”
 - Means of support for the NCCS grew in 2023-24
 - Members of the Near family donated considerable amounts to the NCCS at the ribbon cutting ceremony. The NCCS is deeply indebted to the generosity of the Near family.
 - The Director worked with Page Tisdale and Bobby Houck of TCF to identify donors and corporations willing to finance NCCS activities and provide student opportunities. The Director specifically met with Santee Cooper and Ingevity.
 - The Advisory Board’s Internship Committee advertised paid summer internships with Mount Pleasant Water Works and the State Climate Office. Likely due to the lateness (5/2/2024) and format of advertising, no students took advantage of these opportunities.
 - The NCCS received a Boeing faculty partnership grant of \$1200. With this money the Center purchased a Davis Vantage Pro2 Weather station, which it installed by Wilson athletic field. This new station grows the Citadel Climate Monitoring and Assessment Program, will provide comparison studies with the current “coastal” weather station, and will help athletes and outside workers stay safe.



- SC Sea Grant created marketing materials for NCCS, which are being used by the Advisory Board, Climate Fellows, and others for outreach and promotion.

THE CITADEL
JAMES B. NEAR CENTER FOR CLIMATE STUDIES

NCCS
Promoting Climate Science Through:

- Education
- Research
- Transition to Operations
- Community Engagement
- Public-Private Partnerships

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THE CITADEL
JAMES B. NEAR CENTER FOR CLIMATE STUDIES

WELCOME TO THE NEAR CENTER FOR CLIMATE STUDIES (NCCS)

The Center serves the students and faculty of The Citadel and citizens of South Carolina by enhancing understanding of climate and its variability, change, and risks.

The scope of the Center's activities addresses the relation of Earth's climate to national security, coastal environment and infrastructure, and human health and wellbeing.

THE MISSION OF THE NCCS

- Facilitates interdisciplinary collaboration among faculty, students, and external constituents;
- Fosters partnerships between industry, government agencies, and higher education;
- Provides students, faculty, and external constituents access to data, emerging technologies and research, and other resources related to climate science;
- Promotes innovative and entrepreneurial solutions to real-world concerns related to climate science by developing the technical and non-technical knowledge and skills of its constituents;
- Guides curriculum development in atmospheric and climate science, and prepares students for relevant, emerging internship and career opportunities.

- In partnership with the Dr. Emmett I. Davis, Jr., '50, Department of Civil, Environmental and Construction Engineering the NCCS received its first Senior Climate Fellow: Dr. Tess Doeffinger, Assistant Professor. Because her background is in climate, she was reassigned teaching duties to support the NCCS beginning June 1, 2024. Her specific tasks are to 1) work with NCCS to develop and implement a strategy to identify potential funding sources, pursue opportunities, and submit proposals for external funding and grants, 2) work with NCCS to develop a plan to establish strategic partnerships with other institutions focusing on submitting proposals for external funding and grants, and 3) work with NCCS to advance visioning, strategic planning, stakeholder engagement, and the Climate Fellow program.



Takeaways

The NCCS is making progress increasing operational support financially and with the addition of new materials, staff, and partners.

BUDGET

Budget Category	Amount Spent	Comments
Personnel/labor	\$13,257	Directorship stipend plus fringe
	\$44,066	Director salary plus fringe
Operations	\$1,083.82	Operational expenses
	\$2,892.19	Annual speaker/panel
	\$28,632.55	CRSG

GOALS & CHALLENGES

- **Administration and Communication**

A recurring challenge is not having dedicated administrative assistance for the NCCS. Currently the Center is partially supported by the Dean of the Swain Family School of Science and Mathematics' office and the Department of Physics' office, but the Director spends an inordinate amount of time on administrative tasks. A staff assistant would benefit NCCS in several ways:

- Keeping records of revenues and budgetary expenses
- Engaging with TCF in managing proposals, grants, and gifts
- Gathering data from Climate Fellows
- Communicating important NCCS meetings and events to Fellows and the larger Citadel community
- Working with OCM to promote NCCS successes and connect with alumni (through press releases, newsletters, and an up-to-date website)

This fits into strategic plan: "increase operational support".

APPENDICES

- Appendix A

Order of Events: Climate Symposium and Ribbon-cutting; 15 SEP 2023

Symposium on Climate, and Its Impact on National Security, Coastal Infrastructure, and Human Health and Wellbeing, Swain Boating Center

- 1200-1230: Pre-symposium reception/Hors d'oeuvres
- 1230-1400: Distinguished Panel presentations and Q&A
 Panelists: *Ms. Sherri Goodman, Lt Col Tim Smith (USAF, Ret) '80, Dr. Geoff Scott* (<https://www.citadel.edu/ssm/climate-center/>)
 Welcome remarks from Dr. Zimmerman; Introductions and moderation by Dr. Curtis
- 1400-1430 Move from SBC to Near Center for Climate Studies, Grimsley Hall 1st Floor

Dedication of Near Center for Climate Studies and Ribbon-cutting, Grimsley Hall 1st Floor

- 1430-1435 Welcome (Dr. Zimmerman)
- 1435-1440 Remarks (Dr. Selden)
- 1440-1445 Remarks (Dr. Curtis)
- 1445-1450 Unveiling of Lt Col Jim Near (USAF, Ret) Plaque and giving of the Mementos for the family (Zimmerman)
- 1450-1455 Remarks (James Near III)
- 1455-1500 Ribbon Cutting (Gen Walters, Dr. Selden, Dr. Curtis, Dr. Zimmerman, Mr. Houck, COL Love, James Near III)
- 1500-1530 Refreshments
- 1545 Gold Star Parade

- Appendix B

Date: 13 October 2023

Subject: Minutes of 15 September 2023 Advisory Board Meeting of the Near Center for Climate Studies (NCCS)

Members Present: Scott Curtis (Director), Fred Holland (Chairperson), David Johnston, Hope Mizzell, Mike Johns, Kevin Cooley, Allison Love, Geoff Scott, Albany Irick, Debra Hernandez, and Chris Mack

Members Absent: Joe Coates, Paul Sandifer, Susan Lovelace, Brandon Emery, Kirstin Dow, and Allan Clum,

Guests Present: None

Prepared by: Fred Holland (Chairperson, Advisory Board) & Scott Curtis (Director, NCCS)

Committee Reports:

Strategic & Governance Committee: David Johnston (Chairperson) reported their committee was active ensuring the other committees were engaged including convening a Zoom information sharing meeting of all committee chairpersons on August 28. He commended the Board for their work and interaction between Board meetings, which will continue moving forward.

Health and Wellbeing Committee: Geoff Scott (substituting for Chairperson Paul Sandifer) reported on their activities. The committee collaborated on a committee charter/report exploring what health and well-being means for NCCS and ways the NCCS can contribute (see Appendix A). Their main recommendations were to identify and assess global and local environmental change factors that may significantly affect the health and well-being of the Citadel community and its neighbors, friends, and associates in concert with the proposed Citadel monitoring and assessment initiative. They also proposed NCCS develop a clearinghouse of climate and health information to alert, educate, involve, and inform the Citadel community and others including the public. The committee emphasized that NCCS should focus on heat stress and flood-related health concerns (mold, mosquitoes, termites) in vulnerable communities. The Board felt NCCS was uniquely positioned to assess the factors that drive climate vulnerability and be a broker of information in partnerships with EJ Strong, regional health clinics, churches, interfaith power and light, Greenbank, SafeHome, Engineering with Nature, SC Sea Grant, and other entities.

Outreach and Engagement Committee: Mike Johns (Chairperson) said that their committee reworked their original 2021 document (see Appendix B). They provided clearer direction on outreach and strategies for engagement, with resources for faculty and others associated with NCCS. To ensure a common messaging, they worked with Susan Lovelace and the SC Sea Grant Consortium to develop: 1) a one-page hand out describing NCCS that ensures consistent information about NCCS goals and objectives is provided to everyone, 2) a rack card that provides a lot of information about NCCS in limited space, and 3) a PowerPoint slide that could be used by Climate Fellows to publicize NCCS in research and community presentations. This material was much appreciated by the Board. The committee is also developing a database of contacts related to climate science that should evolve and be dynamic. Finally, they included strategies to enhance visibility, especially to the younger generations through social media.

Internship Committee: Hope Mizzell (Chairperson) reported that she had a lunch meeting with Susan Pope (Citadel internship coordinator) and Allison Dean-Love at the SC Climate Office in Columbia, where they discussed internship opportunities with the SC State Climatology Office. The Internship Committee also had a follow-up meeting with Susan over Zoom, which led to their report (see Appendix C). This report includes contact information, but also important considerations when designing and implementing student internships. The Internship Committee recommended NCCS

actively seek to identify potential internship opportunities for students focused on climate science, flooding, heat stress and resilience. NCCS should also seek to identify internship grant sponsors such as what Boeing provides and keep a spreadsheet of applicable internship opportunities and their status. Emeritus Citadel professor Richard Porcher, IBHS, Ingevity, Santee Cooper, USC, and others were suggested as possible sources for internships. Geoff Scott said that he could guarantee tuition costs would be covered for Citadel students interning in the Arnold School of Public Health and seeking course credit.

Resources and Development Committee David Johnston and Allison Dean-Love (co-chairpersons) said that one of their biggest limitations was a lack of promotional materials, but that has improved with the development of new handouts produced by the Outreach and Engagement Committee. They suggested additional ways to increase visibility would be through the media and podcasts.

A question arose about NCCS's capacity to address the large number of climate related issues that had been identified by the Board in the past several years with only one staff member (NCCS Director) assigned to the Center. It was clear that the Board unanimously feels the Director needs assistance including:

- Marketing strategist and videographer.
- Faculty champion to provide leadership for a monitoring network.
- Lesson plans discussing climate change for K-12 teachers.
- Incorporation of climate change issues and concerns into the Citadel curriculum.

NCCS Proposed Monitoring and Assessment Program: Fred Holland and Scott Curtis provided a brief overview of activities related to the proposed climate monitoring program since the last Advisory Board meeting. Obtaining a "faculty champion" to plan, coordinate, and lead monitoring activities as well as assist Curtis was identified as the major obstacle that needed to be resolved.

Related to the NCCS Monitoring and Assessment Program, Curtis and Holland made two recommendations.

1. The 2023 CRSG competition should earmark money for a Faculty Champion who could enhance capacity and spearhead planning and implementing the monitoring network.
2. The NCCS should propose to the NSF Empowering Broader Academic Capacity and Education (EMBRACE) solicitation (due November 20, 2023).

Both recommendations were unanimously approved by the Board.

Kevin Cooley and David Johnston recommended that the Advisory Board review the NCCS charter and mission. Questions that need to be reviewed include: Is the mission what the Board and The Citadel need NCCS to do? How do we modify the mission to meet The Citadel's current and future needs? Due to shortness of time, the Board tabled this discussion until the Spring meeting. Cooley and Johnston were tasked to present a white paper document to the Board in the interim.

Finally, Curtis announced that Jim Near's sisters generously donated \$50,000 each to the NCCS. He welcomed the Board to attend the symposium, ribbon cutting ceremony, and Friday parade. He thanked Geoff Scott for filling in as a panelist.

Date: 18 April 2024

Subject: Minutes of 21 March 2024 Advisory Board Meeting of the Near Center for Climate Studies (NCCS)

Members Present: Scott Curtis (Director), Fred Holland (Chairperson), David Johnston, Hope Mizzell, Mike Johns, Kevin Cooley, Chris Mack, Paul Sandifer, Susan Lovelace, Brandon Emery, Will Grimsley, Tim Smith, Allison Love (virtual), Geoff Scott (virtual), and Debra Hernandez (virtual)

Members Absent: Kirstin Dow and Allan Clum

Guests Present: Darin Zimmerman (Dean of SFSSM), Kevin Bower (Associate Provost for Academic Affairs and Dean of General Studies)

Prepared by: Fred Holland (Chairperson, Advisory Board) & Scott Curtis (Director, NCCS)

Welcome

Dean Zimmerman welcomed the Advisory Board and thanked them for their service to The Citadel.

Changes to Advisory Board Membership

Fred Holland (Advisory Board Chairperson) reported that Joe Coates and Albany Irick resigned from the Advisory Board. Joe resigned for health reasons and Albany's new job required her to refocus her priorities. Both expressed strong support for the NCCS and were happy to have served on the Board. Next, Fred welcomed Tim Smith and Will Grimsley (new Board members) who introduced themselves and provided a brief biography.

Meeting with General Walters

Fred Holland reported on his meeting with The Citadel President to discuss SFSSM and NCCS. His talking points are attached as Appendix A. At the meeting Gen Walters agreed to consider hosting a Greater Issues speaker on climate and national security and public health. Fred discussed options for Greater Issues speakers compiled by himself and Paul Sandifer. He reported that the Dean and NCCS Director favored RADM Dave Titley. Advisory Board members thought Dave Titley was a good choice. A formal proposal was to be submitted to Col Tom Clark.

Introductions

The Advisory Board introduced themselves for the benefit of Will Grimsley and Tim Smith.

Guest: Dr. Kevin Bower / National Security

David Johnston explained that with the additions of Tim Smith and Will Grimsley there is now momentum behind the Center's stated priority on climate and national security and wanted to know how and in what capacity the NCCS could best engage with The Citadel. Board members, Kevin Cooley, Tim Smith, Will Grimsley, Allison Love and David Johnston identified several ideas that may integrate climate and national security into ongoing Citadel activities, including: addressing/incorporating climate into courses across the college, developing a potential major or graduate program, highlighting the imperative for adapting to climate change strategically, focusing on the breadth of national security beyond military readiness and into infrastructure and energy, nesting climate related activities with other strengths of The Citadel like cyber security and intelligence studies, providing students access to climate wargaming and world-class climate experts (which is a natural fit with a military school), and promoting NCCS to legislators and others for support and funding.

Kevin Bower (Assistant Provost) responded by saying that The Citadel has a sustainability strand (the others are technology and innovation, conflict, citizenship, and wellness) and is strong in STEM research, which could progress into a focus on national security. He said that The Citadel is also interested in encouraging faculty to engage in high impact practices with students, which includes research, internships, and study abroad experiences. Kevin Bower also added that the suggested

curricular pieces are a longer-haul as they require buy-in from faculty and must meet projected student needs. For example, graduate program development must be very strategic and backed by solid justification. He also wanted to be clear that The Citadel does not want to embrace policy development, and the NCCS's mission should focus on the science that can inform policy.

Finally, Kevin Bower reported that The Citadel will be supporting the NCCS with a "Senior Climate Fellow": Dr. Tess Doeffinger. Tess will start as an Assistant Professor of Civil Engineering in Fall 2024. She will be provided one course release per semester to perform the following duties:

- Work with NCCS to develop and implement strategies to identify potential funding sources, pursue opportunities, and submit proposals for external funding and grants.
- Work with NCCS to develop, plan to establish strategic partnerships with other institutions focusing on submitting proposals for external funding and grants.
- Work with NCCS to advance visioning, strategic planning, stakeholder engagement and Climate Fellow program.

Fred Holland suggested that David Johnston, Will Grimsley, Tim Smith, and Kevin Cooley develop a white paper identifying specific action items that could be presented to the NCCS Executive Committee to determine feasibility for implementation and to ensure they were in line with institutional thinking. David Johnston wanted to make sure the NCCS Advisory Board supported moving forward and developing a white paper. The recommendation was unanimously approved. It was decided that a white paper would be presented within six months.

Engaging with the Climate Fellows

Kevin Bower recommended the Advisory Board engage with the faculty at The Citadel starting with the Climate Fellows. The Board discussed having a Climate Fellow (possibly Tess Doeffinger and/or Kaelyn Leake) included as an ad hoc member of the Board. There was also discussion of connecting Climate Fellows with Board members that had similar climate interests and expertise. David Johnston agreed to attend the next Climate Fellows meeting, which is scheduled for April 4, 2024, to learn about the needs and concerns of Climate Fellows with regards to teaching and research and begin formalizing a working relationship.

Committee Reports:

Strategic & Governance Committee: David Johnston (Chairperson) recommended establishing a National Security Committee, which would be composed of himself, Tim Smith, Will Grimsley, Kevin Cooley, and Allison Love. He also invited other Board members to join. Establishment of a National Security Committee was unanimously approved. David also stated that the Strategic & Governance Committee would be looking to create a "pipeline" for new Board members. Diversity is a key consideration. He asked all Board members to present names of potential new members.

Health and Wellbeing Committee: Paul Sandifer (Chairperson) reported that the Health and Wellbeing Committee lacked direction from the NCCS Advisory Board and The Citadel. They also were not sure their charter (Appendix B) was approved. Very few comments were given on the initial draft from the September 2023 meeting. The Advisory Board decided to allow two weeks for final comments via email. Paul said he believed the committee can look for funding sources and would benefit from the Citadel Climate Monitoring and Assessment program to determine environmental exposures. Their committee could also work with Climate Fellows to develop actionable research and community engagement and be a clearinghouse for health data - especially flood and heat/humidity related data. The Health and Wellbeing Committee is interested in forwarding names for potential seminar speakers related to climate and public health to NCCS. Annual seminars could begin as early as Fall 2024.

Outreach and Engagement Committee: Mike Johns (Chairperson) said that they did not get feedback on their current charter or slide materials. The committee is working on developing a contacts database - who are we serving and who could we serve? Mike said the NCCS is doing well targeting

public requests for proposals, but he wanted to provide a manual or roadmap on how the NCCS could enter the consulting business and target specific corporations/businesses. Allison Love recommended the NCCS engage with the Office of Communications and Marketing (i.e. Jonathan Hoffman) more directly.

Internship Committee: Hope Mizzell (Chairperson) stated she is willing to step down from chair of the committee. She is working with Susan Pope (Citadel Internship Coordinator) on internships, but because there are so many restrictions for Citadel cadets, providing/identifying internships is problematic. Internships could focus on adaptation to climate and engineering solutions, which would fit the national security initiative. There was a need for the Internship Committee to reconnect with Allan Clum (not present) about internship opportunities with Mount Pleasant Waterworks. In addition to semester-long or summer internships, there was an idea to examine 1-year fellowships, consistent with a gap year.

Resources and Development Committee David Johnston and Allison Dean-Love (Co-Chairpersons) said that there needed to be a stronger connection between their committee and the Outreach and Engagement Committee. There are several target audiences for resources, but which ones to prioritize? Allison is the face of the NCCS to the Board of Visitors, but she feels she needs more information about what the NCCS is accomplishing to discuss the impact the Center is making to the college.

Director Report: Scott Curtis reported on research, outreach and teaching activities of the NCCS since summer 2023. Despite NSF declining the NCCS proposal “EMBRACE-AGS-Growth: Climate’s Impact on Health, Equity, and Sustainability: A Charleston Student-Community Partnership to Convert Data to Action”, the Center was able to purchase a Davis weather station (through a Boeing grant). Board members suggested that wearable/micro heat sensors might also be useful for The Citadel campus. Other awarded or pending proposals the NCCS is involved in are:

- *Climate Action Engagement Academy for Minority and Women Owned Small Businesses: Fostering Economic Empowerment in the Midst of the Evolving Environment, SC Sea Grant Consortium, FUNDED*
- *Risks, Impacts, and Strategies for Coastal Communities (RISCC): Convergent Research to Support Adaptation Decision-making and Resilience Planning in Communities Disproportionately Affected by Climate Change, NSF EPSCoR, PENDING*
- *SHORES: Strengthening Hope through Oceanfront and Coastal Resilience Engineers, Sea Grant/NOAA, PENDING*
- *Hydro-Social Monitoring for Adaptation, Resilience, and Transformation (Hydro-SMART) in the Caribbean, NOAA, PENDING*
- *Coastal North Carolina Gateway, NASA, PENDING*

Since the last Board meeting, the Director was appointed a member of the South Carolina Climate Science Task Force.

Special Presentation: Ms. Dana Norton:

Dana Norton gave an excellent presentation on her Climatological Research Studies Grant: “Shrimp and Grits: Microplastics in Salt Marsh Sediments and Their Potential Effects on Local Biota.” It was well received by all Advisory Board members.

- Appendix C
- Symposium Speakers - September 15, 2023
- R. Geoffrey I. Scott



- R. Geoffrey I. Scott, is the Clinical Professor and Chair of the Department of Environmental Health Sciences at the Arnold School of Public Health, University of South Carolina and Director of the National Institute of Environmental Health Sciences (NIEHS) Center for Oceans and Human Health and Climate Change Interactions.
- Dr. Geoffrey I. Scott received his BS in Biology from Wofford College and his MS and PhD. in Marine Science from the University of South Carolina. Previous research experience includes: (1) Aquatic Toxicologist for the U.S. Environmental Protection Agency, Bears Bluff Field Station from 1976-80, studying the impacts of water chlorination on estuarine organisms and conducting ecological assessments of oil spill impacts around the world, including assessing impacts of the Ixtoc Well Blowout in the Gulf of Mexico; (2) Director of Toxicology Program and the Wide Awake Landing Marine Field Station for Research Planning Institute from 1980-84, conducting research on hazardous waste sites impacts, oil spills and *Vibrio cholerae* outbreaks in the Gulf of Mexico; (3) Assistant and Associate Tenured Professor at the University of South Carolina's Arnold School of Public Health from 1984-90 working on assessing the impacts of agricultural pesticides, synthetic fuels and urban NPS runoff on coastal ecosystems; and (4) NOAA/NOS National Centers for Coastal Ocean Science, Center for Coastal Environmental Health and Biomolecular Research (CCEHBR), 1990-2014, conducting research that measured the health of coastal ecosystems and evaluates the impacts of changing landscape ecology from urbanization on ecosystem and human health. Dr. Scott was the Director of NOAA's CCEHBR from 2001-2014, and formerly the Acting Director for NOAA's Center for Human Health Risk at the Hollings Marine Laboratory from 2009-2011. Dr. Scott is currently a Clinical Professor and Chair of the Department of Environmental Health Sciences at the Arnold School of Public Health at the University of South Carolina. He is also Director of the NIEHS Center for Oceans and Human Health and Climate Change Interactions housed in the Arnold School of Public Health with Collaborating Universities including the College of Charleston, The Citadel, Baylor University, University of California Irvine, Rutgers University and the

University of Maryland. In addition he has also holds faculty appointment in the Marine Biology Program at the College of Charleston and has previously held faculty appointments at other academic Institutions including the Marine Biomedicine Program at the Medical University of South Carolina and Texas Tech University's Institute for Environmental and Human Health.

- Dr. Scott has served on >116 graduate student research committees and has directed the research of > 60 Masters and PhD Students at various institutions where he holds faculty appointments. He has published > 200 peer reviewed scientific publications, has authored/co-authored > 24 national reports and has served on numerous federal (White House, National Academy of Science, US Congress, EPA, NOAA) and state (SC, CA, VA) expert panels and interagency task forces.

- **Sherri Goodman**



- Sherri Goodman has a three-decade track record of leading, transforming and driving lasting results in organizations as both a board member and executive in international security, national defense, defense industry, foreign policy, energy, environment, critical infrastructure and scientific research organizations.
- Sherri Goodman serves as Vice-Chair of the US Secretary of State's International Security Advisory Board (ISAB). She is also the Secretary General of the International Military Council on Climate & Security (IMCCS), representing over 40 military and national security organizations addressing the security risks of a changing climate. She is credited with educating a generation of U.S. military and government officials about the nexus between climate change and national security, using her famous coinage, "threat multiplier," to fundamentally reshape the national discourse on the topic.
- She is a Senior Fellow at the Woodrow Wilson International Center's Polar Institute and Environmental Change & Security Program, as well as a Senior Strategist at the Center for Climate & Security. Sherri serves on the Defense Science Board Task Force on Climate Change & Global Security.
- Sherri served as the first Deputy Undersecretary of Defense (Environmental Security), (1993-2001), where she was responsible for environmental, energy, safety and occupational health for the US Department of Defense. Sherri established the first environmental, safety and health performance metrics for the Department, and led its energy, environmental and natural resource conservation programs. Overseeing the President's plan for revitalizing base closure communities, she ensured that 80% of base closure property became available for transfer and reuse. She led the Secretary's Arctic Military Environmental Cooperation program which

developed a container for storage of spent nuclear fuel for liquid waste from Russian nuclear submarines.

- Sherri chairs the Board of the Council on Strategic Risks and chairs the External Advisory Board on Energy and Homeland Security for Sandia National Laboratories. She serves on the Board of the Woods Hole Oceanographic Institution (WHOI), the Climate Council of the US EXIM Bank and on the National Academies' Advisory Board of the US Global Change Research Program. Sherri is a Board Director of the Atlantic Council and a Life Member of the Council on Foreign Relations. Sherri is a member of the Joint Ocean Commission Leadership Initiative, co chaired by former SECDEF Leon Panetta and former Governor and EPA Administrator Christine Todd Whitmer. Sherri served on the Independent Review Panel for the DOD Quadrennial Defense Review in 2010 co-chaired by former SECDEF Bill Perry and former National Security Advisory Stephen Hadley.
- Sherri is the former President and CEO of the Consortium for Ocean Leadership. She served as Senior Vice President and General Counsel of CNA (US Center for Naval Analyses). She is the founder and Executive Director of the CNA Military Advisory Board, whose landmark reports include National Security and the Threat of Climate Change(2007), National Security and the Accelerating Risks of Climate Change (2014), and Advanced Energy and US National Security (2017) and The Role of Water Stress in Instability and Conflict (2017) among others. The film The Age of Consequences in which Sherri is featured, is based on the work of the CNA Military Advisory Board.
- Sherri served as the first Deputy Undersecretary of Defense (Environmental Security), (1993-2001), where she was responsible for environmental, energy, safety and occupational health for the US Department of Defense. Sherri established the first environmental, safety and health performance metrics for the Department, and led its energy, environmental and natural resource conservation programs. Overseeing the President's plan for revitalizing base closure communities, she ensured that 80% of base closure property became available for transfer and reuse. She led the Secretary's Arctic Military Environmental Cooperation program which developed a container for storage of spent nuclear fuel for liquid waste from Russian nuclear submarines.

Sherri served on the staff of the Senate Armed Services Committee where she was responsible for oversight of the Department of Energy's nuclear weapons complex, including research and development of nuclear materials and national labs, and environmental cleanup and management. She has practiced law at Goodwin Procter, as both a litigator and environmental attorney, and has worked at RAND and SAIC.

- Sherri has received numerous honors and awards, including an Honorary Doctorate from Amherst College in 2018, the Department of Defense Distinguished Service Award in 1998 and 2001, the Gold Medal Award from the National Defense Industrial Organization in 1996, and the Environmental Protection Agency's Climate Change Award in 2000.
- Sherri has written a book, *The Neutron Bomb Controversy: A Case Study in Alliance Politics*, and authored dozens of reports and articles on a broad range of climate, energy, environmental and national security matters. She is a frequent presenter and lecturer to governments, private and public sector organizations, and academia. In recent years she has spoken at Harvard Kennedy School, MIT, Princeton, Yale, Stanford, University of Chicago, University of Pennsylvania, Middlebury College, Norwich University, University of Idaho, University of Arizona, Virginia Tech, and Georgetown University. She has been an Adjunct Lecturer in International Affairs and Security at the Harvard Kennedy School and an Adjunct Research Fellow at the Kennedy School's Belfer Center for Science and International Affairs.
- Sherri is currently writing *Threat Multiplier: How the Military Got Educated on Climate Change*. A graduate of Amherst College, she has degrees from Harvard Law School and Harvard Kennedy School.

- Lt Col Timothy D. Smith, USAF, (Ret.), '80



- *Chief, Operations Integration Branch, Response Operations Division, Federal Emergency Management Agency (retired)*
- Mr. Tim Smith is an Emergency Manager with 42 years of federal service, 28 in uniform with the U.S. Air Force and 14 with the Federal Emergency Management Agency. He entered federal civil service in 2009, initially serving in Disaster Operations Planning, establishing a new Exercise Unit that led the Administrator's no-notice "Thunderbolt" program; planning and executing over 85 no-notice exercises in two and a half years. He then led FEMA's Continuity of Operations program. In 2015, Mr. Smith deployed to Kiev, Ukraine as part of a planning team to assist in the country's response to the 2014 Russian invasion. Mr. Smith also previously served as the Senior Advisor to the Associate Administrator, who oversees FEMA's Response, Recovery, Logistics and Field Operations Directorates. He stood up the Operations Integration Branch integrating operational capabilities between HQ, 10 FEMA regions and disaster field locations, overseeing the agency's Operations Cadre, Air Operations Unit and \$1.2B in emergency medical and air transport contracts. Mr. Smith was also the Chief, National Response Coordination Branch, leading the agency's National Response Coordination Center including doctrine, staffing, qualifying, and training and a \$4.5M facility modernization. During the COVID 19 pandemic, Mr. Smith filled a variety of roles, including leading the foreign donations effort, leading Community Vaccination Clinics in Philadelphia, PA and Norfolk, VA. These sites administered nearly 500,000 vaccinations in three months. He also led the National Clinical Vaccination Program with contracts providing medical staffing for vaccination and monoclonal antibody treatment nationwide totaling \$3.2B.
- Mr. Smith is a Certified Emergency Manager (CEM®) by the International Association of Emergency Managers. He is a graduate of the Emergency Management Institute's Executive Leadership Academy and has received three FEMA Administrator's Awards - in 2016, 2020, and 2021. Mr. Smith also received the National Voluntary Organizations Active in Disasters (VOAD) Partner of the Year in 2020. In 2021, he was awarded a Bronze Star by the Virginia National Guard for his service to the Commonwealth during their vaccination campaign. In 2022 Mr. Smith was recognized by the Philadelphia Federal Executive Board with an

Excellence in Government Gold Medal for his work leading the Philadelphia Vaccination Center and the DHS Chief Procurement Officer's Excellence award for leading FEMA's emergency contracts during the Pandemic. Mr. Smith is an ICS Instructor, Master Continuity Professional, Master Exercise Professional and HSEEP certified Instructor.

- Mr. Smith held dual qualifications under FEMA's Qualification System (FQS). He was a Resource Support Section Chief in the National Response Coordination Center (NRCC), leading five support groups covering all operations, logistics and Emergency Support Functions (ESFs). Mr. Smith also deployed to the field as a Division Supervisor and Operations Branch Director, including for Hurricanes Irene, Sandy and Ian and historic flooding in Louisiana and South Carolina. He has participated in over 60 Presidentially declared disaster activations including hurricanes, wildfires, winter storms, flooding, tornadoes, earthquakes, volcanic eruptions, and Haiti support.
- Prior to joining FEMA, he completed a 28-year career in the United States Air Force. His varied assignments included operational, staff and command tours in both ground and flying units. Mr. Smith was a Master Air Battle Manager and flight examiner with over 3,300 flight hours in both the AWACS and JSTARS aircraft. He deployed as a Mission Crew Commander on five combat tours for Operations Enduring Freedom and Iraqi Freedom in 2003-2006, with 120 combat missions and over 1,500 combat flight hours. He additionally served a wartime tour with the United Nations in Croatia and Bosnia-Herzegovina in 1994 and Operations Southern and Northern Watch flying 55 combat support missions in 1992-199
- While serving with the Air Force, Mr. Smith responded to a number of disasters, including, as Military On-Scene Commander for the Murrah Federal Building bombing response, managing a shelter for over 1,000 personnel in Mississippi during Hurricane Georges and volunteering with nonprofit organizations during the Hurricane Katrina response in Biloxi, Mississippi. He is a graduate of The Citadel with a Bachelor of Science in Biology and earned a Master of Arts in Biology from Harvard University.

- **Appendix D**

Potential Seminar Speakers for a Near Climate Center "Climate, Health, and You" seminar series

Local/South Carolina

Dr. Daniel Kilpatrick, Clinical Assistant Professor, MPH Coordinator, Department of Environmental Health Sciences, USC, Columbia - expert in disaster response and disaster risk reduction and community engagement. Email address: KILPATDJ@mailbox.sc.edu.

Dr. Dwayne Porter, USC. Professor and Associate Chair, Department of Environmental Health Science, Arnold School of Public Health, USC, Columbia. Expert in environmental monitoring, community engagement, and data management. For more information: https://sc.edu/study/colleges_schools/public_health/faculty-staff/porter_dwayne.php. Email address: porter@sc.edu

Dr. Geoffrey I. Scott,. Chair and Clinical Professor, Department of Environmental Health Science, Arnold School of Public Health, USC, Columbia. Also, Director, Center for Oceans and Human Health and Climate Change Interactions. Expert in aquatic pathogens and effects of climate change on human health. More information: https://sc.edu/study/colleges_schools/public_health/faculty-staff/scott_geoff.php. Email address: Department of Environmental Health Science, Arnold School of Public Health, USC, Columbia

Dr. Leslie Hart, Associate Professor, Public Health, College of Charleston. Uses dolphins as sentinels of human health and climate change challenges. For more information: <https://marinebiology.cofc.edu/about-the-program/faculty-listing/hart-leslie.php>. Email address: hartlb@cofc.edu

Dr. Hayley Guilkey, MD, FAAP, Founder and Chair, South Carolina Health Professionals for Climate Action. Recommended by Brandon Emery. For more information see: <https://shealthclimate.org/about/#>. contact: hayley@shealthclimate.org

Out of State - Possible Virtual Presenters

Dr. Erik Svendsen, Founding Director, Division of Environmental Health Science and Practice, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA. See his linkedin page here: <https://www.linkedin.com/in/svendsen-erik/>. He is an old friend from when he worked in SC at SCDHEC, USC, and MUSC. His email address is: olu5@cdc.gov

Dr. Kristi Ebi, University of Washington. World-class heat-health expert and a wonderful person. More detail here: <https://globalhealth.washington.edu/faculty/kristie-ebi>. Her email address is: krisebi@uw.edu.

Dr. Lora Fleming. Lora is the past director of the European Centre for Health and the Environment at the University of Cornwall Medical School in the UK. She is back home in the US caring for aging parents but is quite active. She is a world-class expert in oceans and human health and in climate-environment-health connections. For more information, see: <https://www.ecehh.org/person/prof-lora-fleming/>. Her email address is: l.e.fleming@exeter.ac.uk>

Dr. Jennifer Runkle, Environmental Epidemiologist, North Carolina Institute for Climate Studies <https://ncics.org/people/jennifer-runkle/>. Her email address is: jrunkle@ncsu.edu