



ANNUAL REPORT 2021-22

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VISION & MISSION

The South Carolina Center on Higher Education formally approved the NCCS June 3, 2021 (the letter can be found in Appendix A). 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 comh6 (i)-2.F tm.s gied -.0 Tfed trsscoh EMC Q BCunpeci



PERSONNEL

The NCCS is comprised of an Executive Committee, Advisory Board, and Climate Fellows.

Executive Committee

The Executive Committee is comprised of Citadel leadership and has oversight of NCCS activities as they pertain to fulfillment of the NCCS Charter.

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

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KEY PERFORMANCE INDICATORS

Academics

x Institute Minor Around Climate Studies, 6.3.1

The Academic Committee met with the Director to discuss plans for an academic minor. The consensus was it should focus on breadth, rather than depth, and include a large list of “elective” courses (many with no prerequisites) to attract the maximum number of students from a variety of majors. The minor may only have one “core” course, which would be PHYS343, Applied Climatology (if the prerequisite to PHYS 243 was removed) or PHYS 244, Extreme Weather and Climate. There was some discussion as to whether it would be more prudent and efficient to modify the current minor “Sustainability and Environmental Studies” (housed in Biology). The minor could be renamed and restructured to have a greater emphasis on climate. A formal proposal will be developed and submitted to Faculty Senate in the 2022-23 academic year.

x Other KPIs Related to Academics

x Number of students in climate studies classes

- o The definition of “climate studies classes” is continuing to be refined, but here is a selection of classes and their enrollments that were offered more than one semester in the past four semesters.

Number	Title	#, Fall 2020	#, Spring 2021	#, Fall 2021	#, Spring 2022
PHYS 244	Extreme Weather and Climate	NA	12	13	NA
NTSS 301	Technical Solutions to Climate Change	NA	NA	14	24
NTSS 303	Biology, Environment, and Law	16	49	24	38
BIOL 209/ NTSS 305	Environmental Science	47	NA	36	NA
CIVL 322	Intro to Env. Engineering	NA	49	NA	37
Freshman seminars	Environmental Hazards	23	21	21	20
TOTAL		86	131	108	119

x Number of K-12 faculty in the Lowcountry who infuse climate science into at least one lesson plan

- o This is consistent with KPI 6.3.4. Nothing to report in 2021-22, but NCCS may contribute to a teachers’ professional development opportunity in the near future.

x Number of Citadel faculty who infuse climate science into at least one lesson/module

- o To increase capacity in this area, the NCCS, in partnership with The Center for Excellence and Innovation in Teaching, presented “Active Learning: Infusing Climate Change into your Curriculum” on 11/2/2021. This workshop was led by Climate Fellow, Dr. Simon Ghanat and attended by ~10 faculty. Dr. Ghanat demonstrated how students can recognize

climate science and (i) . (h 0 Tc -0.que Tw [(di)- (f)-6.k)-2 (s)-2 (ho)2.7 (i)-5 lace0.

Conference Paper

- Race, B. and T. Wittman. "A comparison of dimensionality reduction techniques for hyperspectral imagery." Proceedings SPIE Defense and Commercial Sensing Conference: Algorithms, Technologies, and Applications for Multispectral and Hyperspectral Imaging XXVIII. 1209412 (2022). Orlando, Florida.

Presentation

- "Bridging over troubled waters: Resilience to hydrometeorological hazards in an era of climate change" Scott Curtis: UCOWR/NIWR Annual Water Resources Conference, Greenville, SC, June 2022 (**PLENARY**).
- "Preparing for, responding to, and mitigating compound coastal water hazards for resilient rural communities" Scott Curtis: UCOWR/NIWR Annual Water Resources Conference, Greenville, SC, June 2022.
- "Temporal stability of immobilized cellulases: Functional group density dependence" Danny Swofford and Thad Le-Vasicek: American Chemical Society, San Diego, CA, March 2022.
- "Specific Activity of Enzymes Immobilized to Magnetic Nanoparticles: Dependence on Functional Group Density and Enzyme Density" Sylvester Guillermo and Thaddeus Le-Vasicek: American Chemical Society, San Diego, CA, March 2022.
- "Study of Urban Heat Island in Charleston, SC" Emma Larsen, Simon Ghanat and Scott Curtis: The Citadel 2021 SURE Research Symposium, August 2021, Charleston, SC.
- "Study of Urban Heat Island in Charleston, SC" Emma Larsen, Ezekiel Durand, Simon Ghanat, and Scott Curtis: ASCE SC Eastern Branch April 2022 meeting, Charleston, SC.
- "Study of Urban Heat Island in Charleston, SC" Emma Larsen, Simon Ghanat and Scott Curtis: Southern Conference Research Forum at Wofford University, November 2021, Spartanburg, SC.
- "Study of Urban Heat Island in Charleston, SC" Emma Larsen, Simon Ghanat and Scott Curtis: 2022 ASEE-SE Conference, March 2022 Charleston, SC.
- "Charleston's Sunny-day Flooding: A Pathway for Street-derived Microplastic and Tire Wear Particles into Coastal Waterways" Bonnie Ertel and John Weinstein. Citadel Academy of Science and Mathematics Banquet. March 24, 2022.
- "Rising Seas and Roadway Debris: Environmental Fate of Tire-Wear Microplastic Following Nuisance Flooding in Coastal South Carolina" Bonnie Ertel, John Weinstein, Marian Smith, Jaydee Edwards, Reto Gieré. Virtual oral presentation.



Takeaways

It was a successful year for climate research at The Citadel. Three grants were submitted totaling almost \$1.4 million and research was



- Dr. Scott Curtis presented “The Lt. Col. James B. Near Jr. USAF ’77 Center for Climate Studies” to The Citadel Club of Charleston

- x Number of community Fellows in the Center
 - There has not been growth in this area. There is still one community fellow: Dr. Merrie Koester

- x The Citadel Office of Communications and Marketing (OCM) worked closely with NCCS to promote stories, especially related to the HeatWatch event.
 - CBS, News19 Columbia, SC, May 25, 2022 Interviewed in news story: “Citizen scientists’ needed to help map Columbia’s heat this summer”
 - The Post & Courier, Charleston, SC, December 17, 2021 Quoted in news story: “Infrastructure bill could mean more funding for tree planting, canopy cover in SC”
 -

Industry

- x Other KPIs Related to Industry
 - x Number of climate related internships provided to Citadel students
 - o Nothing to report.
 - x Number of climate career mentoring workshops attended by Citadel students
 - o Nothing to report.
 - x Number of industry Fellows in the Center
 - o None

Takeaways

The NCCS Advisory Board recognizes the importance of nurturing public-private partnerships (built into the mission statement) and added Chris Mack of Stantec and Dr. Albany Irick of MUSC. Two New Advisory Board Committees: Development/Fundraising (chaired by Col. Dean-Love) and Internship (chaired by Dr. Mizzell) will also assist with fulfilling the industry KPIs. Furthermore, the NCCS Industry Committee added Dr. Sergey Ponomarov from the Tommy and Victoria Baker School of Business, which should open up new avenues into industry partnerships.

OTHER MISSION RELATED ACTIVITIES

The Approval and Construction of the Near Center

DESIGN & PROFESSIONAL FEES			
Architectural Fees	\$ 2,250	\$ 2,250.00	Inspected Party Inspectors
CONSTRUCTION			
Construction	\$ 35,000	\$ 49,419.51	IT (demo)
SV Untrades			based on Burkett quote
			\$ 7,768
SOS Climate Technology		estimate until type of technology determined, sent an inquiry on SOS Explorer	\$ 20,000
			\$ 10,300
Furniture	\$ 21,000		
			10% CONSTRUCTION CONTINGENCY
		\$293,342.08	

Marketing Products

- x NCCS now has a roll-up banner to display at conferences, seminars, and other events. See image on page 4. The Center is working with the School's Digital Communications Coordinator on updates to the web page and possibly a trifold brochure.

BUDGET

This estimate of the 2021-22 budget is derived from Banner/Ellucian.

- x Dr. John Lining Professorship
 - o Revenue: Funded by TCF Program for Climatological Studies Endowment listed on TCF Grant Summary. Budget to be established with TCF Grant budget entries
 - o Expenses:
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GOALS & CHALLENGES

APPENDICES

x Appendix A

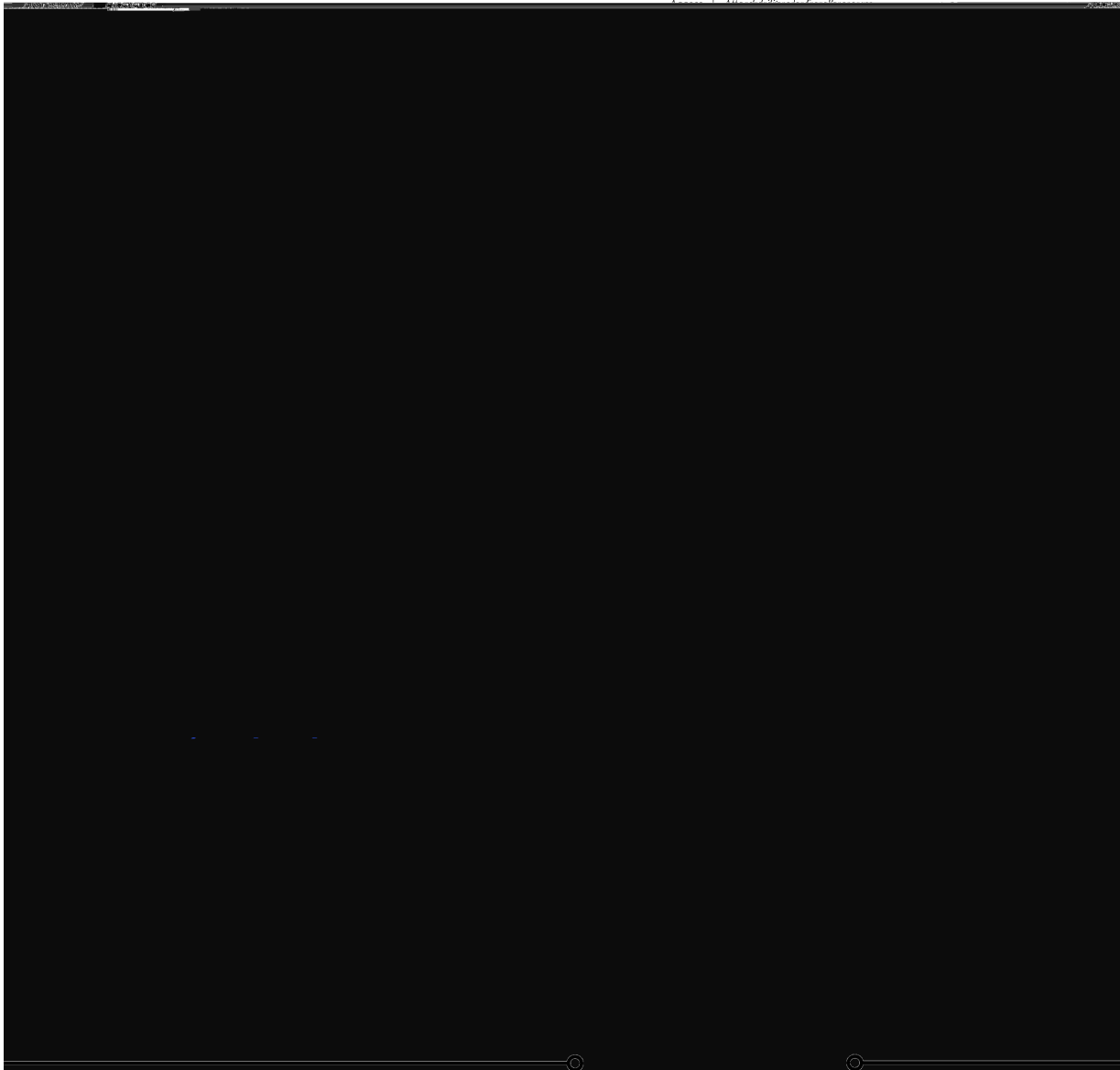
R. West, Jr.
Chairman

Rusty L. Monhron, Ph.D.
Member

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Commission on Higher Education



In the discussion that followed, AB members suggested engaging with churches and faith-based organizations and possibly the local/regional agricultural community. Another organization that should be the focus of NCCS engagement efforts that was identified was the Citadel Alumni Association. The Engagement Committee also suggested the NCCS develop tools and materials to effectively disseminate information and raise awareness of local/regional climate issues and solutions. Ideas for materials included a “canned” PowerPoint presentation about the Center, one-page information sheets on Lowcountry climate threats, and a library of links and resources connected to the Center’s web page. They also suggested developing a “tag line” for the mission statement that would be displayed on all Center materials and communication.

In the AB discussion that followed, the Nature Conservancy, American River1err0.5 (nt)-.e

Date: 5 April 2022

Subject: Minutes of 24 March 2022 Advisory Board Meeting of the Near Center for Climate Studies

Members Present

Ms. Debra Hernandez (Executive Director of the Southeastern Coastal Ocean Observing Regional Association (SECOORA)) stated she was responsible for managing the coastal ocean observing data for the Southeast US. SECOORA's mission is to observe, understand, and increase awareness of the coastal ocean and promote knowledge, economic and environmental health through strong regional partnerships. She stated her presence provided a link between SERCOORA and the NCCS. Debra also noted SECOORA hosts student competitions and provides student travel scholarships to present findings at science meetings.

Dr. Paul Sandifer (Director of the Center for Coastal Environmental and Human Health at the Coll6.6 (r)5n (D)2.62

Center. The membership committee was requested to discuss the above suggestions and report back to the Advisory Board by the fall meeting.

Tag Line: Most members of Advisory Board agreed that NCCS would benefit from a tag line that linked NCCS to the region and The Citadel. Several members suggested that including phrases like “principled leadership in climate issues” in the tag line potentially had negative connotations for future partners working on similar issues. For example, potential partners may feel NCCS is implying that their initiatives and activities were not based on principled leadership.

A vigorous discussion on whether to use the phrase “climate change” or “climate sciences” followed. The Board generally supported the use of either phrase in a tag line. Several members, however, felt strongly that NCCS could demonstrate principled leadership4 -0 0 11 F EMC /P <</MC 76 (i)- 0 Tw 1rne c9eD9k2

Advisory Board members agreed that everyone should serve on at least one committee for at least one year of their 2-year term. Each Board member is responsible for contacting Scott Curtis indicating which committee they would like to serve on or if additional committees are needed. Committee chairpersons were also requested to convene at least one meeting before the next meeting of the Advisory Board.

Action Item 0 11.07 /tional committees are needed.o

CoastalScience@Work

Update from the S.C. Sea Grant Consortium - Issue 29

June 3, 2022

Research Symposium a Success!

Over 100 members of the S.C. coastal science and management communities came together at the Consortium's inaugural [Res](#)

presentations by researchers allowed participants to network in person after a long period of remote connections. Students and professionals delivered poster presentations at an evening reception, with a special address from Rick DeVoe, the Consortium's former executive director, on the importance of student research and mentoring.

The symposium also highlighted needs and opportunities to enhance diversity in coastal- and marine-science fields. An engaging panel discussion focused on the "Intentional Intersection of DEI and Research for Impactful Outcomes." Panel members were Alli Crandell, interim director of the [Joyner Institute for Gullah and African Diaspora Studies](#) at Coasa asC a1E10.1.7 v 0.008 (()0.co)2.71 .6 0 ()18 Link

The Consortium will continue its work to promote [Diversity, Equity, and Inclusion](#) at all levels of research and engagement, which was further enhanced by information gained through this symposium. Based on enthusiastic reviews, the Consortium intends to host a symposium for the S.C. research community annually. For more information, contact [Brita Jessen](#), Interdisciplinary Research and Partnerships lead, [via email](#) or by phone at (843) 953-6417.

Special thanks to Brita Jessen for writing this article and to Emmi Palenbaum, graduate assistant, for providing photos.

Interested in coastal research, education, and outreach? Join our email list to receive Consortium news, publication announcements, and upcoming events!

[JOIN OUR EMAIL LIST](#)

Feel free to forward this email to a friend or colleague.

Thank you!

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