

2019-2020 IMPACTS AND ACCOMPLISHMENTS

SCIENTIFIC LITERACY AND WORKFORCE DEVELOPMENT



IMPACTS

S.C. Sea Grant Consortium's BioDiscovery Program Receives \$9,000 from Bosch

E.V. Bell, S.C. Sea Grant Consortium

Recap: A \$9,000 grant from Bosch to the Charleston County Park and Recreation Commission enabled the expansion of the BioDiscovery program to include training for formal and nonformal educators, online data portal tutorial development, and creation of an educator training guide.

Relevance: Maryland Sea Grant's program, Biofilms and Biodiversity, serves as a STEM (science-technology-engineering-math) opportunity for students to examine the microscopic and fouling communities in local, coastal waters. The program's framework is centered around the deployment of a "biorack": A three-meter long rope with acrylic discs evenly spaced along the length and submerged in the aquatic environment for a period of time. Removal of the biorack allows for students to observe colonization on the discs, including species such as bacteria, algae, invertebrates, and vertebrates. Extensions to this program include calculation of species diversity and abundance, water quality parameters, and species identification. In 2017, Maryland Sea Grant, S.C. Sea Grant Consortium, Clemson University Cooperative Extension Service, and Grice Marine Lab collaborated on ways in which the Biofilms and Biodiversity program could be replicated in South Carolina.

Response: In 2017, the Charleston County Park and Recreation Commission partnered with the Consortium, Grice Marine Lab, and Clemson University to submit a funding request to Bosch to support a pilot program in South Carolina, the BioDiscovery program, based on Maryland Sea Grant's Biofilms and Biodiversity program. This funding request would support teacher training, supplies (digital microscope and biorack supplies), and the development of educational materials and resources, including a teacher manual, species identification guide, and data portal.

Results: Because of the success of the BioDiscovery program in both 2017 and 2018, Bosch awarded the Charleston County Park and Recreation Commission additional funding in the amount of \$9,000 for the BioDiscovery program to continue expanding throughout the state. A 2019 summer training was conducted for more than 15 formal and nonformal educators, and supplies were procured for each participant: a biorack, phone camera lens, data portal tutorials, and revised teacher manual. Additional plans to continue and expand the BioDiscovery program throughout the state to freshwater environments are currently underway.

S.C. Sea Grant Consortium's Beach Sweep/River Sweep Litter Cleanup Saves Taxpayers \$128,015 in 2019

Susan Ferris Hill, S.C. Sea Grant Consortium

Recap: Beach Sweep/River Sweep has economic, environmental, and societal benefits. In 2019, 2,337 coastal volunteers collected over 11.36 tons of litter, covered 137 miles of South Carolina's beaches, marshes, and waterways. There were 90 site captains at 73 cleanup locations across the state. The dollar value of volunteers' time

equals \$128,015. The number of volunteer hours was 5,034. The state's natural resources are cleaner, safer, and more beautiful for all to enjoy.

Relevance: Natural resources account for \$33.4 billion in annual economic output for the state (S.C. Department of Natural Resources, 2016). And according to the S.C. Department of Parks, Recreation, and Tourism, tourism spending reached \$22.6 billion in 2017. Clean beaches, marshes, and waterways are critical to support commercial and recreational boating and fishing, wildlife viewing, tourism, and other industries. A litter-free environment also contributes positively to quality of life.

Response: The S.C. Sea Grant Consortium and S.C. Department of Natural Resources organize the Beach Sweep/River Sweep litter cleanup. Through the use of volunteers, the cleanup contributes to the economic, environmental, and societal well-being of the state. Participants and the public are more informed about natural resource issues, such as litter's detrimental effects on the landscape and wildlife, and people are empowered to take action and become environmental stewards.

Results: In 2019, 2,337 coastal volunteers collected over 11.36 tons of litter, covered 137 miles of beaches, marshes, and waterways, and recycled as much as possible. There were 90 site captains at 73 cleanup locations. The dollar value of volunteers' time is \$128,015 (Independent Sector, 2019). The number of coastal volunteer hours was 5,034.

ACCOMPLISHMENTS

S.C. Sea Grant Consortium Secures Funding and Establishes Diversity Scholarship Program for the Palmetto Environmental Education Certification (PEEC) Program

E.V. Bell, S.C. Sea Grant Consortium

Recap: Funding from the Spaulding-Paolozzi Foundation provides support for up to six diversity scholarships to be awarded for the 2020 – 2022 Palmetto Environmental Education Certification (PEEC) cohort.

Relevance: In 2013, the S.C. Sea Grant Consortium (Consortium) conducted a state-wide needs assessment for the development of the state's first environmental education certification program for formal and nonformal educators. Of the 120 respondents (formal and nonformal educators), 90% stated that a certification program would "improve skills" and 75% stated that a certification program would "increase understanding of environmental issues." Based on this study, the Palmetto Environmental Education Certification (PEEC) program was officially launched in 2018 and has four main requirements: 1) four face-to-face workshops on effective environmental education instruction, 2) eight online modules that supplement information learned during the workshops, 3) a self-directed elective component that fosters exploration of various environmental topics, and 4) a culminating capstone project that demonstrates both mastery in environmental education content and pedagogy. Four main goals frame the PEEC program, one of which is to "train educators who are representative of the diverse communities and regions within the state." Based on 2019 U.S. Census Bureau data, South Carolina has an estimated 37.4% of the population who identify as a person of color (POC); however, despite this percentage, there is still a dearth of diversity within the fields of both environmental sciences and environmental education and interpretation, both within the state and across the nation.

Response: In 2019, funding was secured from the Spaulding-Paolozzi Foundation for the creation of the PEEC Diversity Scholarship program, which will support up to six scholarships in the amount of \$600 each for the 2020 – 2022 PEEC cohort. Eligibility for these scholarships includes any person who identifies as a POC or other

underrepresented minority group.

Results: The PEEC Diversity Scholarship and scoring rubric were created by members of the PEEC Advisory Committee and will be receiving applications beginning July 1, 2020 for the upcoming PEEC 2020 – 2022 cohort.

S.C. Sea Grant Consortium Secures Two Sources of Funding to Initiate Charleston-Area, Community-Level Salt Marsh Restoration Efforts

E.V. Bell, S.C. Sea Grant Consortium

Recap: Funding from the National Oceanic and Atmospheric Administration (NOAA) and the S.C. Native Plant Society (SCNPS) provide the S.C. Sea Grant Consortium (Consortium) with support to expand the From Seeds to Shoreline® (S2S) salt marsh restoration program to a Charleston-area, community-focused initiative.

Relevance: In 2011, the Consortium launched the state’s only salt marsh restoration program for K-12 students, From Seeds to Shoreline® (S2S), in partnership with the S.C. Department of Natural Resources and Clemson University Cooperative Extension Service. The S2S program’s goal is to increase understanding about the salt marsh ecosystem among K-12 students and teachers through their active participation in cultivating and transplanting *Spartina alterniflora* to areas of degraded or eroded salt marsh. The S2S program framework has expanded over ten years to include local partners (“hubs”) within more than 15 coastal and inland counties that work closely with participating schools in their area. As the program has grown throughout the state among the K-12 audience, community-level interest in the program, specifically in Charleston County, has also increased with adult groups indicating interest in cultivating and transplanting *Spartina alterniflora* to their local salt marsh.

Response: In March 2019, the Consortium received \$450 from the SCNPS to pilot community-level restoration efforts in Charleston, S.C., focused on cultivating and transplanting *Spartina alterniflora*. In April 2019, the Consortium partnered with the S.C. Department of Natural Resources to secure funding from NOAA to support community-level salt marsh restoration efforts, specifically related to the species *Crassostrea virginica* and *Spartina alterniflora*, at 13 sites in the Charleston area. The Consortium was a sub-awardee for three years of funding in the amount of \$55,275 to retool the S2S program model to engage local communities in cultivation and transplanting techniques for *Spartina alterniflora*, as well as to develop a citizen science protocol for long-term monitoring of the restored locations.

Results: Two informational community meetings were held in late fall of 2019 and January 2020 with the goal of garnering interest in future trainings, volunteer restoration events, and citizen-science monitoring efforts scheduled to begin in the fall of 2020.

S.C. Sea Grant Consortium’s Palmetto Environmental Education Certification Program Undergoes Evaluation to Be Formally Adopted as an Official Program of the Environmental Education Association of South Carolina

E.V. Bell, S.C. Sea Grant Consortium

Recap: The Palmetto Environmental Education Certification (PEEC) program undergoes review by the Environmental Education Association of South Carolina (EEASC) Exploratory Committee for official adoption.

Relevance: In 2013, the S.C. Sea Grant Consortium (Consortium) conducted a state-wide needs assessment for the development of the state’s first environmental education certification program for formal and nonformal educators.

Of the 120 respondents (formal and nonformal educators), 90% stated that a certification program would “improve skills” and 75% stated that a certification program would “increase understanding of environmental issues.” Based on this study, the Palmetto Environmental Education Certification (PEEC) program was officially launched in 2018 for both formal and nonformal educators. PEEC has four main requirements: 1) four face-to-face workshops on effective environmental education instruction, 2) eight online modules that supplement information learned during the workshops, 3) a self-directed elective component that fosters exploration of various environmental topics, and 4) a culminating capstone project that demonstrates both mastery in environmental education content and pedagogy. For the short term, the Consortium serves as the administrative and fiscal agent for the program; however, the long-term goal for the program’s sustainability is to fold it under an environmental education organization, such as the Environmental Education Association of South Carolina (EEASC), that has the staff, capacity, and in-kind support for this type of program.

Response: Currently, the Consortium’s Marine Education Specialist serves on the Board of Directors for EEASC and also serves as the PEEC Advisory Committee Chair. During a 2019 EEASC board meeting, the Consortium formally proposed that PEEC be considered as an official program offering of EEASC, thereby assuming the financial, logistical, and capacity responsibilities required. The Consortium would maintain its involvement in the program; however, the official organization administering the program would be EEASC.

Results: An EEASC Exploratory Committee was established in 2019 that would assume the responsibility of reviewing the feasibility of PEEC becoming an official program of EEASC. This committee is currently examining the financial, institutional, and logistical considerations of adopting PEEC as a flagship program under EEASC, with an anticipated formal adoption to be made in the fall of 2020.

S.C. Sea Grant Consortium Receives 2019 “Spirit of Cooperation” Charleston County Community Pride Award

E.V. Bell, S.C. Sea Grant Consortium

Recap: The S.C. Sea Grant Consortium received the 2019 “Spirit of Cooperation” Charleston County Community Pride Award for work on the BioDiscovery program.

Relevance: The Charleston County Community Pride awards have been given out for more than 50 years to individuals and organizations in Charleston County that “promote environmental stewardship, work to protect and conserve our natural resources, and are committed to community improvement.” There are 11 award categories and each spring an awards luncheon is given to honor the recipients. The “Spirit of Cooperation Award” is awarded to individuals or organizations that have conducted projects which have both involved other partners and have worked to improve the environment.

Response: In 2019, the S.C. Sea Grant Consortium was awarded, along with the Charleston County Park and Recreation Commission, Grice Marine Lab, and Clemson University Cooperative Extension, the “Spirit of Cooperation” Charleston County Community Pride Award for work on the BioDiscovery program. The BioDiscovery program is a collaborative, STEM (science-technology-engineering-math) education program that involves the deployment of “bioracks” in aquatic environments which are three-meter long ropes with acrylic discs interspersed along the length of the rope. The bioracks, once submerged, will provide substrate for the settlement of bacteria, algae, and other organisms. Participating schools can design their own biorack and use the project data portal to identify and report species that colonize the discs. Water quality data can also be collected in the environment in which the biorack is deployed.

Results: The S.C. Sea Grant Consortium received the 2019 “Spirit of Cooperation” Charleston County Community Pride Award for work on the BioDiscovery program.

S.C. Sea Grant Consortium Marine Education Program Deemed a Best Practice by National Sea Grant Site Review Team

E.V. Bell, S.C. Sea Grant Consortium

Recap: One of the results of an August 2019 National Sea Grant Site Review was that the S.C. Sea Grant Consortium (Consortium) Marine Education program was deemed a Best Practice by the Site Review Team. According to the Site Review Team, “A challenge in Sea Grant education programs is ensuring that teachers incorporate lessons and tools into their curricula. The SCSGC overcomes this challenge by ensuring that all educational lessons and products are linked to state science standards and providing that information on its website.”

Relevance: Formal (K-12) educators in South Carolina are faced with a multitude of time constraints during their workday (and off hours), including administrative reporting demands, standards-based testing preparation, staff trainings, lesson plan/unit development, and classroom management. Time remains a precious commodity, with little extra room in their day-to-day schedule to incorporate new programs, opportunities, or curricula. Many educators must justify to their administration how external opportunities and/or materials will be used with their students, as well as outline how professional development trainings align to their specific grade-level and subject area.

Response: The Consortium’s Marine Education program, recognizing the time demands and constraints on K-12 educators, prioritizes the alignment of every classroom program, long-term stewardship project, professional development opportunity, and curriculum to the S.C. State Science Standards. The Consortium clearly outlines how content aligns with grade-specific science standards by posting this information on the agency’s website and also on specific program products, information flyers, and agendas. By making this information easily accessible, the Consortium assists an educator and the educator’s administration to be able to decide if an opportunity or resource fits well within their classroom curriculum.

Results: The S.C. Sea Grant Consortium (Consortium) Marine Education program was deemed a Best Practice by the Site Review Team as a result of the August 2019 National Sea Grant Site Review.

S.C. Sea Grant Consortium Website Redeveloped to Provide User-Friendly Experience, Ease of Navigation, and Accessibility

Susan Ferris Hill and Crystal Narayana, S.C. Sea Grant Consortium

Recap: The S.C. Sea Grant Consortium’s redeveloped website, www.scseagrant.org, was launched June 19, 2019. The website is a source of science-based information for researchers, decision-makers, educators, and the public about coastal and marine topics, as well as agency organization and administrative processes. The navigation is intuitive, content is optimized for search engines and fast performance across a broad range of devices, follows Web Content Accessibility Guidelines 2.0 for ADA compliance, and contains a robust internal search feature.

Relevance: The Communications team led the redevelopment effort because the legacy website did not have the modern design people are accustomed to, did not have a user-friendly or intuitive navigation, had restraints on the type of content that could be added, had a less-than-ideal search feature, and was not mobile-friendly.

Response: The Communications team worked with Consortium staff to develop the architecture, navigation, and content for the website. As one of the main sources for science-based information, resources, and organizational procedures, the website provides publications and information generated from the Consortium's administration, research, extension, communications, and education departments.

Results: The S.C. Sea Grant Consortium's redeveloped website, www.scseagrant.org, was launched June 19, 2019. The website features intuitive navigation, optimized content for better search engine results, fast performance across a broad range of devices, and adheres to Web Content Accessibility Guidelines 2.0 for ADA compliance. In addition, a robust search page with enhanced internal search function and topics by category helps users search for and find specific information quickly.

S.C. Sea Grant Consortium *Coastal Heritage* Magazine Deemed a Best Practice by National Sea Grant Site Review Team

Susan Ferris Hill, Joey Holleman, and Crystal Narayana, S.C. Sea Grant Consortium

Recap: One of the results of an August 2019 National Sea Grant Site Review was that *Coastal Heritage*, the Consortium's flagship publication, was deemed a Best Practice by the Site Review Team. According to the Site Review Team, "The quarterly, *Coastal Heritage*, provides a superb resource to the community, in South Carolina and beyond. The integration of science and scholarship with history and culture is a model of excellence and is a tradition well worth preserving."

Relevance: *Coastal Heritage* has been published by the Consortium since 1982. Over time, the publication evolved from a four-page bulletin to a 16-page magazine. *Coastal Heritage* is part of the Consortium's long-term strategy to increase scientific literacy and to improve public understanding of South Carolina's coastal and marine environment, culture, and history.

Response: Hard copies of *Coastal Heritage* are distributed to a well-maintained list of 5,000 national and international subscribers. Text and PDF versions are available on the Consortium website at www.scseagrant.org/coastal-heritage. The target audience includes students and teachers from middle school to postgraduate, scientists, natural-resource managers, urban and regional planners, coastal property owners, coastal business owners, coastal visitors, S.C. legislators, government agency and municipal staff, non-governmental organizations, news media, and the general public.

Results: *Coastal Heritage*, the Consortium's flagship publication, was deemed a Best Practice by the Site Review Team during the August 2019 National Sea Grant Site Review.

S.C. Sea Grant Consortium Publications Won Three Prestigious Awards

Susan Ferris Hill and Susan Lovelace, S.C. Sea Grant Consortium

Recap: The Consortium won three prestigious awards for three publications. *Coastal Heritage*, the agency's flagship publication, won a Distinguished Award from the Society for Technical Communication-Carolina Chapter. The Consortium's website, www.scseagrant.org, won an APEX Award of Excellence in the Most Improved Website category. The publication, *Susceptibility of Public Health Impacts from Flooded Water, Wastewater, and Public Health Infrastructure*, won a Notable State Document Award from the South Carolina State Library.

Relevance: Recognition by communications professionals and librarians from the Southeast region and the State

of South Carolina is one metric by which success is measured. Acknowledgement that publications are relevant, interesting, well-researched, and provide significant information to the public confirms the Consortium's public service role is successful.

Response: The Consortium regularly submits publications to various award competitions. The primary contributors to these three publications are staff in the communications, extension, education, and administration departments, as well as university partners.

Results: The Consortium won three prestigious awards from the Society for Technical Communication-Carolina Chapter, APEX, and the South Carolina State Library.

S.C. Sea Grant Consortium Fosters Student Support through Internships, Fellowships, and Research Opportunities

Susannah Sheldon, S.C. Sea Grant Consortium

Recap: In 2019, S.C. Sea Grant Consortium supported eight undergraduates, 18 master's-level students, and 17 Ph.D. students in conjunction with Consortium-funded research, projects, and fellowships.

Relevance: Supporting undergraduate and graduate students and early career professionals leads to an informed, engaged, and well-trained workforce.

Response: The S.C. Sea Grant Consortium is involved in several initiatives that support education and professional development for these individuals. Fifty-five Knauss fellows have been selected from South Carolina since 1984, and 20 Coastal Management fellows from South Carolina have been placed with various state agencies nationally since 1997. In addition, the Consortium partners with the S.C. Space Grant Consortium to support the annual Kathryn D. Sullivan Earth and Marine Science Fellowship, designed to increase the number of highly trained earth and marine scientists and to enable graduate students to conduct NASA- and NOAA-related Earth/marine science research.

Results: In 2019, S.C. Sea Grant Consortium supported eight undergraduates, 18 master's-level students, and 17 Ph.D. students in conjunction with Consortium-funded research, projects, and fellowships. Of these, 18 were new to Sea Grant support and 25 were continuing to receive support. Five of the graduate students were S.C. Sea Grant Consortium extension, education, and administration interns for the Consortium. Three Consortium-nominated students were selected for the Knauss fellowship and one for the Sullivan award. S.C. Sea Grant Consortium student support has improved ocean and coastal literacy among university students and early professionals and encouraged their success in securing coastal- and marine-related employment.
