

PROCEEDINGS:  
**Multicultural Pathways to  
Ocean Sciences Education**



# Proceedings: Multicultural Pathways to Ocean Sciences Education

## **Hosts:**

COSEE SouthEast  
South Carolina Sea Grant Consortium  
Avery Research Center for African American History and Culture College of Charleston  
Savannah State University

**May 21-23, 2003**

Avery Research Center, College of Charleston  
Charleston, South Carolina

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# Prologue: “That Could Be Me”

Homage to Ernest Everett Just



Ernest Everett Just

A prominent African American scientist, Ernest Everett Just, secured a place through his intellectual and scientific skills, at the forefront of marine biology. How he accomplished such success, given the rise of “Jim Crow” in the Deep South, and debilitating racism in the Northeast during his early educational and professional years, is inspiring for anyone considering a career in marine sciences.

Ernest Everett Just was born in 1883 in Charleston, South Carolina, the son of Charles Fraser Just and Mary Mathews Cooper. He died in 1941 at the peak of his career at his sister’s home—a few blocks from the Howard University campus in Washington, D.C., where he had taught. When he died, Howard’s trustees stood for a moment of silence.

Just was the grandson of Mary Anne, a free black woman of unknown origin, and Charles Just, Sr., a highly prosperous and industrious man. Born in 1805, Charles Just, Sr. was a mulatto. He was the former slave (though some accounts indicate that he was never legally a slave) as well as the natural son of German immigrant George Just. George Just had built a very successful wharf-building business, and Charles continued that success in his adult years. Charles Just, Sr. “was well-respected in the black community of Charleston. He moved in Charleston society as a ‘free man of color’...making him indistinguishable from the upper-class blacks in the city” (Manning, 1983, p. 6).

Ernest Just’s mother was cautious about educating her young son at the Avery Normal Institute, which opened in 1865 following the Civil War. Although the school “had a reputation for excellence, preparing its students for college and training them ‘in the old New England standards of efficiency’ ... it catered mainly to light-skinned, upper-class blacks rather than to the black masses and would probably not have looked on Ernest with favor” (Manning, 1983, p. 18). Instead, young Ernest received his early educational training from the Colored Normal, Industrial, Agricultural and Mechanical College in Orangeburg, South Carolina (now South Carolina State University).

*Just continued his education at Dartmouth College and the University of Chicago. He had an illustrious career in the scientific world and in the classroom, through his teaching at Howard University and research experiences at Woods Hole in Massachusetts. His research interests focused on the process of fertilization in marine invertebrates. But the racist practices common during his early professional years, both in the South and at Woods Hole, along with his growing disillusionment with the black world at Howard, took him to Europe as early as the 1930s, particularly Germany and Italy.*

*In Europe, Just's scientific work became more theoretical. He concentrated his work on the study of the cell surface in the development of the organism. Forced out of Germany and Italy by Nazism and Fascism, Just established his laboratory in France at a marine station in Brittany. When the Nazis invaded France in 1940, French laboratories turned their backs on him and closed him out of his lifelong work in Europe. He was captured and interned. Upon his release, Just returned to the United States and died of pancreatic cancer a year later at the age of 57.*

*The life work of Ernest Everett Just was profound. He authored nearly 100 scientific and other scholarly articles. "On Government Monopolies," published in 1903 in the Kimball Union, was his earliest. He also published several articles in the Dartmouth Magazine. Two other articles included "Breeding Habits of the Heteronereis Form of Platynereis megalops at Woods Hole, Mass.," published in 1914 in the Biological Bulletin; and his last publication, "Fertilization-Reaction in Eggs of Asterias rubens," in the Anatomical Record in 1940.*

*Ernest Everett Just leaves a rich legacy for students wanting to be marine scientists ... "That could be me "*



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## Section 1. The Charge for the Charrette

The Center for Ocean Sciences Education Excellence SouthEast (COSEE SouthEast) is actively seeking advice, leadership, and counsel in order to address the charge of the National Science Foundation (NSF) to increase access to underrepresented and underserved populations in ocean sciences. COSEE SouthEast, one of the seven NSF awardees, has taken this charge as one of its primary objectives.

NSF charged each of the COSEE sites to develop strategies that will provide a more diverse ocean-sciences workforce and ocean-literate public in the future. COSEE SouthEast chose to emphasize the rich coastal cultural history as one strategy. The purpose of COSEE SouthEast's multicultural charrette was to explore ways to increase and ensure that underrepresented, underserved, or minority populations have access to ocean sciences education in this region. Minority populations identified by the U.S. Census Bureau include Blacks or African Americans, American Indians and Alaska Natives, Asians, Native Hawaiians and other Pacific Islanders, and individuals of Hispanic or Latino Origin <http://www.census.gov/pubinfo/www/hotlinks.html>.

Dr. Matthew Gilligan, professor of marine sciences at Savannah State University and member of the COSEE SouthEast Board of Advisors, suggested that the first efforts of COSEE SouthEast should address strategies to encourage more African American participation in the ocean sciences.

The role of COSEE SouthEast is to help create new opportunities for developing discovery-based ocean education activities that are strongly connected to the southeast region and to regional ocean-science research efforts. The southeast coastal region carries a rich legacy from Native and African Americans.

From May 21 to May 23, 2003, seventeen participants and visitors took part in the first charrette, titled, "Multicultural Pathways to Ocean Sciences Education." The location of the charrette was the Avery Research Center for African American History and Culture at the College of Charleston in Charleston, South Carolina.

The sponsoring institutions for the charrette included COSEE SouthEast, the South Carolina Sea Grant Consortium, the College of Charleston Avery Research Center for African American History and Culture, and Savannah State University (Appendix 3).

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## Section 2. Establishing the Charrette Framework

### *“It Takes a Village to Raise a Family”* (African Proverb)

This African proverb establishes a framework for organizing the charrette and is used as a guide for preparing the proceedings from the May 2003 charrette on Multicultural Pathways to Ocean Sciences Education. Some background regarding the Center provides context for the charrette.

The Center for Ocean Sciences Education Excellence SouthEast originated in the visionary leadership of Paula Keener-Chavis, then Director of the Math and Sciences Hub at the College of Charleston and now National Education Coordinator for the National Oceanic and Atmospheric Association (NOAA) Office of Ocean Exploration, based in Charleston. In preparing the NSF grant proposal that launched the Center for Ocean Sciences Education Excellence SouthEast (COSEE SouthEast), Paula understood that ethnic minorities, in general, and African-American students, in particular, were underrepresented in the field of ocean sciences. Her inclusion of this issue in the proposal made this longstanding topic a centerpiece for COSEE SouthEast.

Paula’s vision was further strengthened in the leadership of Dr. Lundie Spence, who became Director of COSEE SouthEast in Fall 2002. As one of her first efforts at the new center, Lundie, along with Dr. Karen Chandler, then Director of the Avery Research Center for African American History and Culture at the College of Charleston, initiated plans for formal discussions to occur. This effort initiated one of the first events bringing together multiple partners – a primary objective of COSEE SouthEast and also an essential African philosophy. Through the collaboration of partners, and not any single effort in isolation, COSEE SouthEast’s objective to help attract and retain underrepresented students to ocean sciences might be realized.

In order to develop a solid foundation for COSEE SouthEast’s effort, the first step was to convene a group of experts from several perspectives in order to discuss options, previous programs, and resources. From these discussions, the director, staff and Board of Advisors of COSEE SouthEast could begin to develop strategies, initiate tasks, create partnerships, and generate interactions. Within a month, a meeting had been planned and participants invited. The format of the meeting would be a charrette—an intense set of discussions among diverse specialists focusing on a single objective. Dr. Vivian Williamson from Texas was invited to facilitate the charrette. Dr. Karen Chandler was asked to provide a set of proceedings of the event and develop a set of common themes and recommendations or tasks. These proceedings provide the summary and record of the event.

The mission of COSEE SouthEast, *“Spark and nurture collaborations among scientists and educators to advance ocean discovery and make known the vital role of the oceans in our lives,”* is based on research and conclusions from many experts and national efforts. For example, the National Research Council’s 1996 report, *The Role of Scientists in the Professional Development of Educators*, concludes that scientists do not understand what teachers do, just as teachers insufficiently understand of the work of scientists. This mutual misunderstanding results in missed opportunities to use the exciting discoveries of oceanographic research to capture the imagination of young minds and involve students in a lifetime of science learning. Specific to this charrette, the plan to take advantage of previously missed opportunities must be more inclusive of underrepresented and underserved populations. In designing the charrette, we believed that the involvement of other educators, including those in the fields of African-American studies and history, plus scientists, might identify innovative opportunities to meet COSEE SouthEast’s

objective. Therefore, the COSEE SouthEast “family structure” extends to participants of the charrette, as well as to current and future partners of COSEE SouthEast. The “families” are the scientists and educators who already work with marine, earth, and atmospheric concepts, plus educators in state departments of education, historians, faculty with Historically Black Colleges and Universities (HBCUs), coastal cultural laypeople, and informal educators associated with museums, science centers, cultural and research centers, and archival repositories. This set of families form a viable “village,” one we believe is necessary to create a new paradigm that builds on existing and successful programs. Further, this “village” might help realize COSEE’s objective of attracting more African American and other ethnic students to ocean sciences.

In the charrette, the participants would be asked to explore strategies to enhance academic attraction to the ocean sciences. They would also be asked about the possibilities of using the coastal heritage and other historically related issues as an additional strategy to introduce African American students to the ocean sciences field.

Many students, including prospective African American students, have been attracted to ocean sciences through early experiences with the ocean with their families. A strong, academic inclination and passion toward research in chemistry, biology, geology, or engineering leads students to investigate marine topics. Others may have an interest in environmental stewardship. However, for some African American students, the rich coastal African American history and its related cultural traditions could be the magnet for career choices.

The agenda for the charrette was designed to encourage maximum interaction among participants with full-group discussion, small-group breakout sessions, field experiences on a research vessel, and social time (Appendix 1). The facilitator kept the dialogue focused, and videotaping of the interaction provided a record of the dialogue, which formed the basis for these proceedings. The participants were selected based on their involvement with COSEE SouthEast and their experiences with ocean sciences, diversity efforts, and science education (Appendix 2). The four criteria for invitations were academic experience with past programs/projects for underrepresented populations in science in precollege programs; academic experience with programs/projects for undergraduate/graduate underrepresented populations; precollege teaching experience in multicultural classrooms; and personal experiences of what worked for them. Preparation for the charrette included a number of readings of precollege, undergraduate, and graduate programs and projects that constitute “best practices” for underrepresented groups in ocean sciences.

The charrette design is a “world of event” approach, rather than a “world of view”—conference format. In “Removing the Veil,” author and cultural artist, Benny Ambush, explains these approaches. “World of View thought ... is static, refractory, individualized, analytical, linear, and manipulative,” and was not considered a strategy for our gathering. But “World of Event” thought ... embraces symphonic relationships.” Its work culture is horizontal or spherical in nature rather than hierarchical, more reliant on oral transmission than the written word ... Knowledge is respected regardless of its source, and is more likely to come from those with core direct experience. Openness and tolerance are honored values, and intuitive factors hold sway along with empirical data. ‘We’ is a more prevailing notion than ‘me’ (p. 82-85).” It was natural for the charrette to embrace a “World of Event” perspective for COSEE SouthEast, along with the rich and fertile soil of the Avery Research Center for African American Research at the College of Charleston and the longstanding educational legacy it embodies.

Thus, the charrette was not a workshop or conference in the traditional sense. The charrette concept is mostly applied to art and architectural efforts to develop an integrated design for a building, landscape, community center, or other multidisciplinary product. It is characterized as a



creative, intense work session—a collaborative planning process that brings the talents, experiences, and energies of a diverse group of participants to create and support a feasible plan that represents transformative change. The transformation in this charrette was to serve as base preparation to increase access to ocean sciences for underrepresented and underserved populations. Its objective was to identify at least two to three workable ideas or projects for COSEE SouthEast to promote in 2003-2005.

These proceedings represent a distillation of three days of intense, often emotional, and focused dialogue, facilitated by consultant Dr. Vivian Williamson of Houston, Texas.

The proceedings capture the personal experiences that catapulted charrette participants' involvement in ocean science education, or that nurtured their passion for learning and identified common threads, workable strategies, successful projects, and programs. The proceedings are focused on objectives for COSEE SouthEast and ideas of innovative or “tried and true” projects for COSEE SouthEast to initiate, partner, or promote.

Dr. Karen Chandler, then director of the Avery Research Center and now Associate Professor of Arts Management at the College of Charleston, began the charrette with insight on some of the Southeastern U.S. history associated with African Americans. Between 1700 and 1800, at the height of the Atlantic Slave Trade, 40 percent of Africans who were forcibly shipped to mainland North America came to the shores of South Carolina. Specifically, between 1700 and 1775, approximately 80,000 to 110,000 Africans came through Charleston Harbor – the primary slave-trading port for the entire southern Atlantic seaboard—as well as to the “pest houses” on Sullivan’s Island. The profound experiences of African peoples, from their embarkation – on Goree and Bunce Islands in Senegal and Sierra Leone, respectively, and the ports of Angola and the Congo, plus the Middle Passage – to debarkation in Barbados and other Caribbean islands and on the shores and land of Charleston and the sea islands, reveal connections to the ocean that are absent in other ethnic groups.

The archives at the Avery Research Center contain references to many interesting historical topics and issues that could be used to attract students to ocean sciences, including:

- The presence of African-American sea captains, fishermen, and their families that have made their business from the ocean and the land in the coastal southeast
- The Atlantic slave trade, which brought enslaved people from West Africa to the shores of South Carolina, Georgia, North Carolina, and Florida, and which continues to reflect remnants of the culture referred to as Gullah-Geechee
- The cultivation of rice from southern North Carolina, the South Carolina Lowcountry, and Georgia to northern Florida, which began in the 1600s, a major factor in the importation of specific populations of Africans for labor based on techniques of irrigating rice fields in West Africa, especially those from the Mano River Region—Sierra Leone, Senegambia, and the Angola-Congolese regions
- The coiled basketmaking, using bulrush (*Juncus*) found in the salt marshes and sweet grass (*Muhlenbergia*) found on barrier islands, which many scholars believe parallels the rise of rice cultivation on the southeastern coast of the United States
- The expansive regional development of southeastern coastal areas (Hilton Head, S.C. is a notable example) that is dismantling indigenous history, linguistic patterns, foodways, and other cultural traditions

- The system of land ownership, including issues involving inheritance where extended families collectively own land
- The current efforts by the National Park Service to preserve the history and traditions of the Gullah-Geechee sea islands, and
- The establishment of new museums, notably the International African-American Museum proposed for Charleston that would, in its core and changing exhibits, document the story of African Americans and their connections to the ocean.

Charleston, the South Carolina Lowcountry, and the sea islands of South Carolina, Georgia, and Florida, remain among the few places in the United States where indigenous African cultural practices have survived. These include language, folklore, storytelling, fishery businesses, religious practices, music with its syncopated rhythms and call-and-response patterns, dance, foodways, basketmaking, ironwork, and carpentry. These Africanisms are known as Gullah in South Carolina and Geechee in Georgia. Gullah and Geechee are present-day terms that refer to the descendants of various African ethnic groups, including the Ashantis, Fantes, Fulas, Ibos, Mandingos, Yorubas, and Bakongos. The Gullah language is a Creole language. It is the only English-based Creole language that still exists in North America. The Gullah language is derived from English and African sources. Many believe that the word Gullah, or “N’Gulla,” comes from Angola, where historians believe the majority of slaves to South Carolina originated.

The seventeen participants of the charrette included the following individuals: Sue Bowden, N.C.; Sheila Brown, MS; Karen Chandler, S.C.; Jennifer Jolly Clair, S.C.; Sue Cook, VA; Willie Frazer, S.C.; Albert George, VA; Joyce Hilliard-Clark, N.C.; Dionne Hoskins, GA; Paula Keener-Chavis, S.C.; Ashanti J. Pyrtle, FL; Jeffrey O. Roberts, N.C.; Andrew Shepard, N.C.; Lundie Spence, S.C.; Brenda Chee Wah, GA; Carrie Thomas, N.C.; and Vivian Williamson, TX (Appendix 3).

The coordinators of this charrette – Karen Chandler, Lundie Spence and Matt Gilligan – thank each of the participants, and most especially, Dr. Vivian Williamson, our guide. It was a learning experience and a true “family affair.” Special thanks to the Avery Research Center for hosting us and for the work of the COSEE SouthEast team in preparation for our gathering. The sponsoring institutions were COSEE SouthEast, South Carolina Sea Grant Consortium, College of Charleston Avery Research for African American History and Culture, and Savannah State University (Appendix 2).

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## Section 3. Identifying Issues and Programs

### *“To kno’ deh, you haffa go deh”* (Gullah Saying)

The translation of this Gullah proverb or saying—*To know there, you have to go there*—is demonstrated by the efforts of many people who have served on panels, written articles, and participated in symposia, and who have experienced or created successful ocean science programs for underrepresented students (Appendix 4).

Dr. Bradford Brown, Senior Advisor to the Director of NOAA’s National Marine Fisheries Service, wrote the following in the *Marine Technology Journal* (Hannaham, 1983) about the status of underrepresented and underserved populations in the ocean sciences, and repeated his quote during the Fall 2001 meeting of the National Association of Marine Laboratories (Gilligan, 2002: <http://hermes.mbl.edu/labs/NAMS/MR.html>). His words, two decades ago, address some of the same issues in the field today:

The fundamental principle regarding the role of minorities in marine affairs is the observation that while a number of minorities, Black Americans in particular, have had a long history of involvement in the maritime and marine sectors of the economy of the United States being represented in the merchant marine, on the docks, whaling vessels, in fish processing plants, etc., they have only miniscule representation in those areas in the marine sectors that involve professional and scientific management and marine policy. It is axiomatic that the lack of involvement at the latter levels of the economy have both robbed the United States of an important segment of potential talent needed to address critical problems, but it also sets the stage for decisions to be made that may directly or more insidiously indirectly adversely affect those components of society not represented at the table. Historically, minorities have not been welcomed in marine professions, or at many of the institutions which train people for these professions. Furthermore, this history creates a vicious cycle that perpetuates itself by ensuring that the incoming generation is made ignorant of the opportunities available in marine areas. This lack of role models can become critical.

In the call for proposals, the National Science Foundation Division of Ocean Sciences initiated a program to establish a network of coordinated centers to facilitate collaborations and communications between ocean science researchers and educators. These Centers for Ocean Science Education Excellence (COSEE) were asked to foster the integration of ocean research into high quality educational materials, allow ocean researchers to gain a better understanding of educational organizations and pedagogy, provide educators with an enhanced capacity to understand and deliver high-quality educational programs in the ocean sciences, and provide material to the public that will promote a deeper understanding of the ocean and its influence on each person’s quality of life and our national prosperity. Within the criteria for any proposal was Objective Four, which is to ensure that underrepresented groups in the ocean sciences have improved access to ocean science education and research results. Historically, the field of oceanography

has not attracted a diverse set of students, and only limited progress has been made in the past decade. Individual Centers should make a concerted effort to include underrepresented groups in educational activities, both formal and informal, involving the oceans.

We refer to the ocean sciences as part of the geosciences. The Geosciences Directorate of the NSF describes the breadth of this discipline: "...a complete understanding of the Earth system demands that (Geosciences Directorate) support discovery in a vast number of disciplines as well as in an interdisciplinary context. Supported studies range in spatial dimension from solar processes, which ultimately affect the Earth, to studies of microbial life within the Earth's sub-oceanic crust, and temporally affect from processes such as chemical reactions, which take place in an instant, to processes such as continental drift, which take place over millennia. <http://www.geo.nsf.gov/geo/about/whatisgeo.htm>."

The Geosciences Directorate includes earth science, ocean science, and atmospheric sciences. Other agencies use the term "Earth Science" to cover ocean or marine science, as well as geology, meteorology, hydrology, and climatology. Earth System Science includes earth science disciplines as well as the life sciences, geography, and ecology. The American Geological Institute (AGI) defines geosciences as the science of exploration, discovery, and Earth stewardship. The geosciences address all issues relating to Earth Systems, including the solid Earth, oceans, and atmosphere. (<http://www.earthscienceworld.org/>)

In order for the members of the charrette to understand the critical lack of diversity in the ocean sciences and some of the past efforts to remedy this situation, a number of reference papers and websites were suggested for preparatory reading. These references addressed: (1) reasons for the marginalization of students of color; (2) demographics of students who pursue undergraduate and graduate degrees in ocean sciences; (3) current data on academic enrollment and graduation rates in all areas of geosciences; (4) criteria for successful programs in ocean sciences; and (5) programs that have been effective in addressing the underrepresentation of students of color.

**The following ten references with a brief summary of the content presented a strong case for the charrette to address this dilemma and build upon existing programs.**

1. *Proceedings from the National Association of Marine Laboratories, Diversity Panel, Fall 2001 Meeting*  
Website: <http://hermes.mbl.edu/labs/NAMS/MR.html>  
Authors: Matt Gilligan and Sue Cook

These are the transcriptions from the panel "Marine Education Diversity, Retention, and Recruitment," consisting of Dr. Matt Gilligan, facilitator, with Drs. Benjamin Cuker, Judith Vergun, Brian Bingham, Dionne Hoskins, and Bradford Brown. Their report listed the following criteria for successful programs in ocean sciences for underrepresented students:

- Strong institutional support/commitment at the top
- Allocation of human and fiscal resources to mentoring and other programs
- Establishment of long-term programs (e.g. academic year, two quarters) rather than short term, ad hoc programs (e.g. summer internships)
- Coursework in basic marine science with lecture, lab, and experiential field component
- Tutorial remediation, if needed, with a focus on math and writing
- Advice to students on strengthening their resumes



- Completion of an independent research project and opportunities for presentations at conferences
- Support network of potential employers to give students a realistic view of marine science careers
- Collaboration between minority institutions and majority institutions for exchanges of undergraduate and graduate research experiences for resident students
- Combination of traditional and non-conventional recruitment strategies
- Paid internships for undergraduates in science, technology, engineering, and mathematics disciplines
- Curriculum development workshops on ways to integrate African American and Native American coastal heritage issues and topics in marine science curriculum

2. *U.S. Commission on Ocean Policy Testimony*

Web site: <http://aslo.org/download/gilligan2000.pdf>

Author: Matt Gilligan, January 2002

Overview: A testimony to the U.S. Commission on Ocean Policy in which Gilligan provides reasons for the underrepresentation of African Americans in the ocean sciences and proposes solutions.

3. *Raising Minority Academic Achievement: A Compendium of Education Programs and Practices*

Web site: <http://www.aypf.org/rmaa/>

Author: James, Donna Walker, Sonia Jurich, and Steve Estes (2001).

Washington, D.C.: American Youth Policy Forum. What Do We Know About Raising Minority Academic Achievement?

4. *The Science House/IMHOTEP*

Web site: <http://www.science-house.org/student/imhotep/>

Author: Joyce Hilliard-Clark

Overview: Imhotep Academy introduces underrepresented students (African Americans, Hispanic, Native Americans, women) in the sixth through eighth grades to science, mathematics and technology at N.C. State University. The program introduces students to the rigorous and exciting worlds of chemistry, mathematics, marine, earth, and atmospheric sciences, physics and statistics through laboratory experiments, research projects, classroom instruction, and field trips.

5. *To Close the Gap, Quality Counts*

Web site: <http://www.edweek.org/sreports/qc03/templates/article.cfm?slug=17exec.h22>

Overview: For North Carolina, South Carolina, and Georgia to close the “academic achievement gap” between minority and non-minority students and those from rich and poor families, programs must first address the “teacher gap,” which is the dearth of well-qualified teachers in low-achieving schools.

6. *Minorities Striving and Pursuing Higher Degrees of Success (MS PHD'S)*

Web site: <http://msphds.eas.gatech.edu/about.htm>

Author: Dr. Ashanti J. Pyrtle

Overview: The Minorities Striving and Pursuing Higher Degrees of Success (MS PHD'S) in Earth System Science initiative was developed by and for underrepresented minorities (African Americans, Hispanics, Puerto Ricans, Pacific Islanders, Native Americans and Alaskan Natives, hereafter referred to as minorities), with the overall purpose of facilitating our increased participation in Earth system science. MS PHD'S was established with a goal of providing professional development experiences to facilitate the advancement of minorities committed to achieving outstanding Earth system science careers. This Web site is a major contribution and compendium of data concerning ethnicity in the earth and ocean sciences. It provides insights on the correlation that exists between enrollment, graduation rates, and career choices among ethnic students in the geosciences field. Since a doctoral degree is considered the "gold standard" for research and academic scholarship in the geosciences, the information in Table 1 from MSPHD'S provides a clear picture of the dilemma of diversity in the earth sciences.

**Table 1.** Proportion of the U.S. earth system science doctoral degrees awarded to minorities in 1998 (NSF, 1999). (credit to MSPHD website)

Earth System Science Discipline	African American	Hispanic	Native American
Life Sciences	3.2%	4.0%	0.41%
Physical Sciences	2.2%	2.6%	0.45%
Earth, Atmosphere and Marine Science	1.6%	2.8%	0.50%

7. *Graduating More Minority Ph.D.'s in Math and Science*

Web site: <http://chronicle.com/colloquylive/2003/03/math/>

Overview: Presented by The Chronicle of Higher Education "Colloquy Live" March 26, 2003. How can colleges and universities encourage more minority students to prepare for graduate study in mathematics and science?

American universities have largely failed to attract and graduate black and Hispanic Ph.D. candidates in mathematics and science. Nationwide, fewer than 6 percent of Ph.D.s awarded in those fields go to such students. Rice University, however, has had success in producing minority Ph.D.'s. Since 1998, its department of computational and applied mathematics has awarded 23 doctorates. Eight of them have gone to black or Hispanic students. Twelve, more than half of those awarded, have gone to women, compared with a 27-percent share of Ph.D.'s in math for women nationwide.

8. *"NOAA Expanding Opportunities Conference in Oceanic and Atmospheric Sciences—Inclusion, Innovation, and Investment"*

Web site: <http://epp.noaa.gov/>

Overview: 2003 Conference hosted by Florida A & M University, Tallahassee, FL, is sponsored by NOAA Educational Partnership Program with Minority Serving Institutions. Regular conferences convene in different states to provide location for scientific presentations and discussions on increasing diversity.

9. *Minorities at Sea Together*

Web site: <http://www.hamptonu.edu/science/marine/MAST/>

Author: Ben Cuker

Overview: A multidisciplinary program for students to explore the Chesapeake Bay. Students spend three weeks under sail, studying marine science, policy, and the heritage of African Americans and Native Americans on the Chesapeake Bay.

10. *Minorities in Aquatic Sciences*

Web site: <http://www.aslo.org/mas/>

Author: Ben Cuker

Overview: The MAS program was initiated in 2001 to establish a database and electronic resources to link minority students interested in the aquatic sciences and to enhance their participation in aquatic science community activities and careers.

## Section 4: The Charrette as a Village

### *“Forward Ever, Backward Never”*

This Rastafarian axiom has meaning for the participants’ efforts during the charrette. They shared their past experiences and looked to the future with commitment.

The metaphor of a village, with its elders and families, also has special meaning for the participants’ work throughout the charrette. Each brought their experiences to bear in discussions with one another. In these proceedings, readers will experience the degree of trust and revelations that can take place during a charrette experience.

The Griot: Facilitator



**Dr. Vivian A.  
Williamson**

**Dr. Vivian A. Williamson**, a highly sought-after consultant in training and supervision, author, academic researcher, and curriculum specialist, was, in traditional African terminology, our “griot.” A griot is a highly respected elder of the community who is the keeper of oral tradition and a storyteller. Above all, the griot is one whom those in the village look to for preserving the stories of African people.

Vivian served as facilitator of our deliberations and our stories. With a doctorate in administration and supervision from the University of Houston, a Master of Arts in African American and Modern European Studies from Southern Methodist University, and a Bachelor of Science degree in Human Development from the University of Texas at Dallas, Vivian was a consummate facilitator.

Her academic credentials include certifications with the Comer Project for Change in Education at Yale University, TQM (Total Quality Management) and the DuPont Leadership Certification with Region X Education Service Center in Texas, Texas LEAD Center in Houston, and the International Community of Re-Evaluation Co-Counselors in Seattle, Washington.

Vivian is currently a grant coordinator for the APEX Math and Science Teacher Training Project for the San Jacinto College South/Aerospace Center and coordinates partnerships with school districts in the San Jacinto College South service area. In this capacity, she also provides teacher training to higher-level math, science, and technology teachers. Additionally, Vivian is an adjunct instructor at the University of St. Thomas and teaches courses in Human Growth and Development for teachers. She is also the Program Evaluator for the project directed by Dr. Ashanti Pyrtle, Minority Students Pursuing Higher Degrees in Ocean Sciences. This program was a NASA-funded grant to increase the retention and success of minority students pursuing degrees in the ocean sciences.

Vivian’s extensive consulting experiences have included meetings with the School Development Program of Yale University. Consultancies with this program have included the Comer Project for Change in Education Institutes (CT), Skillman Foundation and Detroit Public School Leadership (MI), Kansas City Principals and Central Administration (MO), Mississippi State



Department of Education and Greenville Administration (MS), Texas State Board of Education, Millsaps College Principals Institute (MS), Guilford County School Administrators and Parents (N.C.), Charlotte-Mecklenburg School District (N.C.) and the Rockefeller Foundation. She has provided training, facilitation, and evaluations for school districts in Houston and Dallas, the National Science Foundation's Program for Gender Equity in Science, Mathematics, Engineering, and Technology, and the City of Dallas, among others.

She has received prestigious honors and awards from the Dallas Regional National Alliance of Black School Educators, Dallas Independent School District, Dallas Parks and Recreation Department, Black Dallas Remembered Historical Society, School Development Program of Yale University, and received an honorary doctorate from Rialto Community Bible College in Rialto, California, for advocacy for underrepresented communities as a member of the Dallas Parks and Recreation Board. Vivian serves on numerous boards and is active in many civic and community service organizations, including the Selma Butler Institute for Leadership Development and Empowerment of African American Parents and Patrons, and the Dallas Chapter of the National Political Congress of African American Women.

### The Family: The Charrette Participants

In lieu of brief introductions, the members of the charrette revealed their own personal stories. These case histories became important in noting the common threads that existed in each other's distinct histories. The following are those stories – the personal experiences that connected us to role models and the people in our lives who were catalytic in our choices of careers in marine science, education, cultural administration, and philanthropy. This "sharing" allowed us to see what obstacles we have encountered and how they were met.

The results of the sharing of life stories allowed the participants to examine the following themes:

- challenges we have observed or experienced that K-12 underrepresented students face in being attracted to the field of ocean sciences;
- issues and skills that either prohibit or engage students to be interested in ocean sciences;
- incentives or disincentives that exist or do not exist for underrepresented students in choosing colleges;
- incentives or obstacles for students to pursue advanced and terminal degrees; and
- the degree to which non-minority educators and administrators are allowed in the conversations and decision-making about the issues that impact underrepresented students in ocean sciences.

Vivian threaded together our stories and found that, in each personal history, our experiences involved similar commonalities. Often we expressed what Vivian defined as the "Cycles of Life:" (1) when there is calm and we have an opportunity to enjoy the beauty of the world around us – when we are received with open arms from the people around us; (2) when stormy experiences happen and things in our world fall apart; and (3) when, because of our disappointment in the people and things in our world, a period of recovery and regrouping takes place.

## Our Stories...Lessons Learned



**Sue T. Bowden**

**Sue T. Bowden** grew up in a segregated environment in North Carolina. She began teaching high school when “forced” desegregation came to North Carolina.

Sue describes herself as an “outside, dirt-loving human.” She loves horses and ponies and lived in an extended community that reported her every move to her parents. Her grandmother was significant in Sue’s life. Sue’s strong psychological outlook and development is attributable to her grandmother. But only recently did Sue realize that her grandmother was a “suffragette – women’s libber.” She believed that women could do what they wanted to do.

Sue grew up as an only child, a “daddy’s girl,” and was “spoiled to the very roots of my being,” she says. As a result of being an only child, she believes she related early in life to animals. She was quite good at diagnosing problems with her dogs and horses.

Her father ran a grocery business. Sue would hang out with him, often falling asleep among the feed bags in the back of the grocery. While in the back of the store, often before she dozed off to sleep or when she was awakening, she would listen to the talk of men who hunted in the area. There was a rich mixture of people who her father traded with. They were black and white folk, but not Native Americans. There were people around her who were Ku Klux Klan leaders. Even in this environment, Sue was never brought up to look at or treat other people differently.

Sue’s mother and dad were hard-working people. They were high school graduates, not college graduates, although her uncle went to the University of North Carolina at Chapel Hill. She was expected to do her very best at whatever she chose to do. And she was always told to “remember who you are.”

Sue’s first introduction to science was in high school. She liked science and wanted to study it in middle school, but her school didn’t offer it. However, in high school, the Future Teachers of America (FTA) offered an opportunity for Sue to focus her interests. FTA was an important time of centering and focusing for Sue.

Sue went to the all-women’s Meredith College in Raleigh, N.C., and there she developed leadership skills. In college, she majored in biology with an emphasis in chemistry. She thought she might be interested in being a veterinarian. But North Carolina did not have a veterinary school, and she was told that, as a woman, she wouldn’t make it as a vet. Only a small number of students from North Carolina were selected to attend the University of Georgia vet school the year she wanted to attend. Sue was told that she would not be selected because she was a woman and “I wouldn’t practice because I would end up getting married.” Thus, she completed a degree in biology with a teaching certification and let her hopes of veterinary school die.

After completing college, Sue married her former high-school English and history teacher. She began a career in teaching by accepting a job as a science teacher in Duplin County, N.C.

She taught high school biology, physical science, and chemistry to a more ethnically diverse student population than she had grown up with in Duplin County. Duplin was a mixture of populations of people from both the low and upper middle-class socioeconomic strata. Sue had a good high school teaching experience, although she did not relate well to the linear approach to teaching (such as first, second, third periods, etc.). However, she was always drawn to children that needed help, regardless of their racial background.

Sue went to UNC-Chapel Hill for graduate school and was one of only two or three women in the science education program at that time. “Barry” was Sue’s professor and advisor, and his students were called “Barry’s Boys.” They all considered what name the two females should use, since “boys” was not appropriate. The women suggested keeping the name the same—“we’ll just be Barry’s Boys, too,” they said. But we “won’t be ‘Barry’s Broads’ and we won’t do coffee.” UNC was an adjustment and a great learning experience for Sue.

Sue grew up landlocked, but once she overcame her fear of the water, she loved it. Sue describes the fear her mother put in her about the ocean. “My mother said to never get in water above you knees. If you do, something will grab you and eat you, and then you’d die!” says Sue. For years, Sue avoided the ocean, but now she loves the marsh and the ocean.

Sue worked at UNC-Pembroke as the director of a high school outreach program for a biomedical project. High school students were involved in DNA testing, and they became excited looking at sickle cell and other biomedical projects. It was hard to believe that some of these students were considered not the best students, said Sue. Once they became excited about learning, they all did well. Sue realized that she had reached at least one student who said, “I think I might be able to do science after all.”

Ever since Sue realized that “you have to work really hard to get your bottom under water when you’re snorkeling, that you can’t drown easily,” she realized “that my momma was lying to me. I have enjoyed every area of the salty area we call oceans! I love the smell of hydrogen sulfide! It’s invigorating!” Sue reminds us to re-examine Voyage of the Mimi – a multimedia program for middle and high school children that shows ocean sciences can be a career option for all students. “The world can be a child’s oyster,” says Sue.

Sue encourages her students “to be a sponge and drain your professors of every bit of knowledge they have, and then use it.” Sue’s motto is, “chance favors the prepared mind.” Doors do open, but you must be prepared.



**Shelia A. Brown**

**Shelia A. Brown** was born in New Orleans below sea level! She lived close to the levee and played in ditches, dipped for minnows and crawfish in canals and along the river battue, and waved to men passing by in the big ships of the Mississippi River.

Shelia spent summers in Mississippi. As in New Orleans, nature in Mississippi was her fun. She played in the rivers, canals, ponds, and the Mississippi Sound. Sheila would crab on the Sound, walk on the piers and sea walls, and take the one-hour walk back home. She and her friends discovered dead things and would bury them in their graveyard. She believes that, in the future, some archeologist will probably wonder what happened in their graveyard!

Who enabled Shelia to enter the field of ocean sciences? She responds that other people supported her entry into ocean sciences; she always excelled in science and math. There was Mr. Herbert Wire, a precursor to Bill Nye, the Science Guy. He was Shelia's chemistry teacher in high school who told her to go to college, even though she didn't think she was smart enough to attend. Her parents didn't go, so why should she? But, thanks to Mr. Wire's urging, she went.

Shelia majored in microbiology and chemistry at Louisiana State University, although some of her college professors wanted her to switch to other disciplines. Her important days at BioOceanic Research, Inc. consisted of waiting for oil companies to fly in sewage for her to test; therefore, she immediately worked hard to get a retroactive scholarship to Loyola University. She remembers Father Mullahy of Loyola admonishing her as he reviewed her transcript, telling her that she was not a biologist because she had never taken a botany class. He acknowledged her work at BioOceanic Research and indicated that the university had an offshore engineering scholarship program that she may be interested in, but it was only for men. He agreed to "work on this ... maybe they'll change their minds." Periodically, he would update Shelia but with no positive response. One day, he convinced the committee, and her scholarship became retroactive. Shelia knows that it was because of Father Mullahy that her financial needs had been met.

In her second year at Loyola, Father Lesseps encouraged her to enter a doctoral program. But she wanted to continue her work at BioOceanic Research as a technician and "keep those sewage samples coming in." The two disagreed about her career and academic pursuits; Shelia didn't actually believe she could master a doctoral program.

But she gave in and applied to the University of Southern Mississippi (USM), a Sea Grant College, for admission and a fellowship. Dr. Jean Wooten of USM made it financially feasible for Shelia to pursue her doctorate by employing Shelia as her research assistant. Shelia appreciates the hard work on her behalf. "All of these people, and my parents, had faith in me, so I have to start paying back," she says. Today, Shelia "pays back" by learning all she can about financial aid to assist the students she works with at the University of Southern Mississippi. "I'm here because of my experiences with, and help from, other people," says Shelia.



**Karen A. Chandler**

**Karen A. Chandler**, our host at the Avery Research Center, grew up landlocked in Nashville, Tennessee. Her only introduction to the water was in the Tidewater area of Virginia (Newport News/Hampton), where she would visit her grandmother each summer during her childhood. But Karen's enjoyment of the water did not include a career in ocean sciences. For Karen, who now lives in Charleston, South Carolina, the water now symbolizes a special, historical place – a "spiritual" place where her ancestors traveled against their will and lost their lives both unwillingly and willfully. The shores of Charleston were the destination point for the transatlantic route that enslaved thousands of Africans, bring them to North America.

Karen's career and life experiences are unlike those of other charrette participants. She, like Willie, has been an educator—a music teacher and arts-management administrator. As host of the charrette, and through her former directorship of Avery, she believes in making the African American history and culture of coastal South and North Carolina, and the Sea Islands of Georgia, a vehicle to attract students to ocean sciences.



Her childhood solidified her own sense of place and culture as an African American female. She grew up in segregated schools until her high school years in Nashville. She loved music and was guided by the teachings of her mother's best friend, Sarah Phillips, who later grew to become Karen's mentor in music and in life. Her early education was shaped primarily by black females who had taught her in school, in Sunday school, in church choirs, and in piano studios. These women were central to her life.

Karen's precollegiate years were spent in two worlds—studying piano with Sarah Phillips while also studying theory, music history, violin, and piano at the prestigious Blair Academy of Music (now associated with Vanderbilt University), where no peers or teachers looked like her. Nevertheless, she was a successful music student, having been one of few before her to win a full scholarship for music studies at Blair.

Karen's pastor, another mentor, was Reverend Kelly Miller Smith, Sr., a classmate of Dr. Martin Luther King's at Morehouse College. She remembers her pastor and her church as a pillar of the civil rights movement in Nashville. The Reverend King, as she remembered him, would come to her church "just to preach." She has remained blessed to have been "grounded" in an environment of strong civil-rights history, economic activity, and political activity in Nashville – all rooted in the church.

Even with this grounding, Karen's eighth-grade year shook her firm cultural foundation. She attended a private school in Nashville with a dozen of her peers. They were only a handful of black students in what she remembers as "a sea of white students." Their experiences in this very different environment were challenging, and, at times, shattering for many of them, including Karen.

But Karen's educational experiences at Hampton University were nearly perfect for her. Not only did she continue to have exceptional and firm African American female role models as her teachers, but they were also advisors in her extracurricular life. They were the advisors to her sorority, the mothers-away-from-home, and the confidants. Their mentorship happened both in and out of the classroom—a very holistic relationship for Karen.

Karen's early career in arts management began in New York City, a striking change in diversity for her. There she met people from all over the world, became best friends with a "sistah friend" who spoke five languages, and met many different people with different interests and persuasions. She quickly learned to accept these differences—something she had never been challenged to do.

Karen's success in teaching students and directing African American cultural programs and historic sites such as Avery's is due, in large part, to an array of people, mostly women, from whom she has learned and grown, primarily black women and other women of color. However, the diversity of places, people, and experiences in her career has strengthened her resolve to teach students about preserving and documenting African American history and culture through music, managing historic sites, or understanding the role of history and culture in our lives in, around, and near the ocean.



**Brenda Chee Wah**

**Brenda Chee Wah** was born in the United States, although her mother's native land is Trinidad/Tobago. Her elderly aunt, who was steeped in Trinidadian culture, knew every person in her small community. This old Trinidadian culture, Brenda remembers, was one in which "anybody could tell you anything as long as they were one year older than you!"

Her mother was a single parent who believed that education in the U.S. was not good enough for her daughter and sought to educate Brenda in Trinidad-Tobago. Most of Brenda's friends wanted to come to America to avoid Trinidad's outhouses and the eggs that tasted different! But her mother would have the last word.

Brenda was an enigma in Trinidad, because she had an American accent. She attended a Catholic high school—a culture shock for her. In school, she had very powerful teachers who were both nuns and laypeople. While they were firm teachers, they did not expect students to go into the sciences. However, one teacher who was adept in the sciences encouraged Brenda to pursue science and taught her, one-on-one. As a result, Brenda was the only person in her class to complete science requirements, receiving a full certificate for a high school diploma.

In Trinidad, Brenda was surrounded by the sea. She knew what it was like to get up in the morning and smell the sea. Seabathing was a part of her life. Brenda also had experiences of pulling the "seine." "When fishermen would bring in fish, if you pulled the seine, you'd get fish." Brenda did nearly everything imaginable on the beach, although she was not sure why. She talked to fisherman, cooked, and ate on the beach.

She later enrolled in college. A friend of Brenda's was her math teacher in college. Brenda had to draw the line between her friend and her teacher. She didn't do well in the class, although later, a class project resurrected her grade in the class. Her improved grades were attributed to the "expectation" her friend-teacher had of her.

Brenda's first teaching experience was at a coastal village school. On Friday, her students did not attend because they caught crabs on Friday. Brenda stated that, in these instances, "you had to teach students where they were," taking into account that these children's coastal lives were intertwined with the water.

Early in her teaching career, Brenda began to wonder why her students were not achieving, and she became interested in special education. Like Joyce, she taught the kids that no one wanted to teach. Brenda's philosophy, however, was that her "duty as a teacher was to teach the people's children." She created an environment in which she "expected" her students to work hard. She empowered them to be in charge of their projects and assignments; Brenda remembers that "they didn't have time to breathe!" With these strategies, she alleviated the challenges of teaching so-called problem students.

Brenda left Trinidad five years ago—August 17, 1998 to be exact – to start over in the U.S. She came here with no job, no place to live, two children, and 8,000 American dollars. "Because I'm from the Caribbean, where floor space is plenty of space," she and her children lived with a cousin, applied for Social Security, and learned to pray. "God does many things," she knew. Her friend at Clark-Atlanta University, Dr. Denise Stephenson-Hawk, helped her daughter to receive

a partial scholarship. Dr. Stephenson-Hawk also needed someone with an education background to develop a teacher development program and evaluate teachers in an earth-sciences program for middle school students. Brenda enthusiastically began work but did not have a Social Security number. Each day for two months, Brenda would get up, travel to work, and work hard, but could not be paid. Clark Atlanta's motto is "find a way, make a way," a phrase that applied to Brenda as well. Not long afterward, Brenda's Social Security card was approved, and she carved a position for herself at Clark Atlanta. Now her own home is storage for people from Trinidad/Tobago who need it!

Brenda believes that teacher expectations are critical for students, but she finds little of this philosophy among today's schoolteachers. She is concerned that teachers are frustrated and not motivated to create opportunities that "expect" excellence from students. In her work as a research associate with the Earth System Science Program at Clark Atlanta, she helps teachers deal with unmotivated students, cope with their own frustrations, and increase student achievement.



**Sue Cook**

**Sue Cook** grew up in Florida, and, as a child, she loved to go to the beach to collect shells. She had mentoring experiences similar to many charrette participants. Her chemistry teacher, the head of the high-school science program, told Sue that she had "what it took" to do math. As a result, Sue knew early on that she should consider a career in math and science.

Sue grew up in a "lily-white environment" in Florida. When she went to Newcomb College in New Orleans in the late 1950s and mid-1960s, she had no idea about other ethnic cultures. That was before she met her lab partner, the first black woman in the life sciences at Newcomb. She was a very determined young woman who gave Sue a glimpse into another world of people who lived in the South. While Sue was at Newcomb, there were fewer than a dozen black students anywhere on the Newcomb/Tulane campus. Her lab partner later became a medical doctor and researcher.

Following Newcomb, Sue returned to the all-white environment of her childhood. She later met another scientist, Clay, who would become her husband. They lived and worked in Georgia, Canada, California, Ohio, and Boston. Then, in the 1980s, Sue and Clay relocated to Bermuda, where her career focus, much like the transition that Al George made, shifted from being a science researcher to a science educator. Bermuda was, for her, a wonderful experience that had her interacting with an ethnically diverse range of people. In addition to working with black Bermudian students at the Bermuda Biological Station (BBSR), Sue helped Ben Cuker from Hampton University set up a highly successful field trip program for black students from the United States. Sue later obtained scholarship funding from the Exxon Corporation for black and Hispanic students at BBSR, and she continued to work with Ben Cuker on diversity initiatives in the sciences.

Following the richness of her Bermuda experience, Sue moved back to Florida to be with her mother, who had developed Alzheimers. In Florida, she partnered with Matt Gilligan at Savannah State University (SSU) to introduce African American freshmen and sophomore students to research and careers in the ocean sciences. The Bridge to Research summer program that Sue and Matt created was funded by NSF for nine years and consisted of ten weeks of

intensive skill-building and projects that introduced students to the work of research scientists. Students worked together as a group on the SSU campus for four weeks and then traveled to Harbor Branch Oceanographic for five more weeks. Mentors also came from other colleges and programs to interact with the Bridge cohort.

Sue believes that, to successfully attract and retain minority students in the ocean sciences, an early introduction to the field is essential. While she admits to having little or no personal experience with the challenges facing underrepresented students in ocean sciences, her work with COSEE SouthEast and the charrette is purposeful. She seeks to better understand these issues, so that she can foster better programs. At the time of the charrette, she worked as a program officer in the Ocean Sciences Division of NSF. Today, she is Education Director at the Consortium for Oceanographic Research and Education (CORE) in Washington, D.C.



**Jennifer Jolly Clair**

**Jennifer Jolly Clair**, COSEE SouthEast's curriculum specialist, grew up in a desegregated environment. She was tracked early into the Gifted and Talented Program and College Prep in elementary and high schools. Jennifer was blessed with unconditional love from her parents, though not necessarily unconditional support for her career choices. Jennifer did not experience her guidance counselors as gatekeepers. In fact, she never spoke to her guidance counselors, because she did not see them as people who could appropriately and effectively guide her. She was clear about her direction without their help and was never interested in anything except science.

Jennifer does not recall a particular experience that catapulted her into science. Like Ashanti, she was discouraged from specializing in marine biology. She was told to consider a general biology degree. Consequently, Jennifer's academic and career mentors were "atypical." They were not her teachers, guidance counselors, or parents. Jennifer drew on the mentorship of several other individuals, including her husband and an "outside" support system of experts in the field, including Lundie Spence, with whom she works with COSEE SouthEast; Leslie Sautter, who hired her to work with Project Oceanica and COASTeam curriculum development; and others. Jennifer believes that mentors and other "guiding forces" in the lives of students may come from nontraditional places.



**Albert George**

**Albert (Al) A. George, Jr.** grew up in Savannah, Georgia, and was never taught to swim, even though he was fascinated by water. When he was 19 years old, Al met Dr. Matt Gilligan at Long Key during a Spring Break marine laboratory research tour. Matt gave Al a review article to read; he read it 100 times! (The review article was on non-mammalian marine models in biomedical research) At that point, Al knew he was destined for work in biomedical research. Matt would change the course of Al's life.

Al applied for a National Institute of Health program at Yale Medical School that aimed to attract minority students interested in the biological sciences. Al interviewed program staff by asking, "how interested is your institution in biomedical models in marine research?" Professor John N. Forrest, Director of the Office of Student Research at Yale University School of Medicine, asked Al to elaborate on this question. Al explained: "How interested is your



institution in using sharks and squid to elucidate human health and disease?” Professor Forrest told Al that he had been involved in shark biomedical research as a nephrologist for 25 years. Professor Forrest wanted Al to work with him on his research in cystic fibrosis.

Professor Forrest served as a catalyst for Al’s early biomedical career. Al attended Yale to pursue biomedical research, following a career in marine sciences. In New Haven, Al became involved with minority teens from at-risk and challenging environments. Although the programs taught students about marine science, Al was shocked to learn that the children did not know how to work with computers – an important skill set for students in any marine science program.

This discovery motivated Al to become more interested in science policy and education. He worked with Matt Gilligan at Savannah State University, as well as with community groups and parents. While involved in this task, he had an epiphany – his life’s work should involve helping people through science policy and education.

Al entered the Kennedy School of Government at Harvard University and wrote a policy analysis paper on how to use marine science as a framework for helping students. With this new course and direction, Al worked with Dr. J.K. Haynes at Morehouse College in Atlanta, even though Dr. Haynes told Al that “since I didn’t go to Morehouse, I didn’t receive a true education!” Al used his science and policy background while working with Dr. Haynes, who was involved with a David and Lucille Packard Foundation program at Morehouse. At Morehouse, the average SAT scores were 1450. Al had mentored a student in the program who had a 3.9 grade point average and a 1500 SAT score, but who almost flunked out because of issues of self-doubt. Al concluded that, even with students who showed strong academic ability, issues of self-doubt, fear of succeeding, and other social and cultural issues often surface in students’ academic experiences.

Drs. Gilligan, Forrest, and Haynes were Al’s mentors. Through their guidance, Al received the support system, work, motivation, and one-on-one facilitation that helped him avoid similar issues and experiences. Al is currently pursuing his doctorate at the Georgia Institute of Technology in Science, Technology Policy, and Biology, and is working on building skill sets and mentoring programs for students in the sciences from Pre-K to the postgraduate level. His life’s work, he adds, is to be “a change agent.”

In addition to being a full-time graduate student, Al also serves as Director of Development for the Jumpstart for Young Children program ([www.jstart.org](http://www.jstart.org)). This is an early childhood education (Pre-K) intervention literacy program working toward the day when all children enter school prepared to succeed.



**Willie Frazier**

**Willie Frazier’s** area of expertise is not in science. However, he has had a long and distinguished career as an educator. Today he is an education associate with the South Carolina Department of Education. Willie attended segregated schools in Moncks Corner, South Carolina (20 miles west of Charleston). As a child, he learned the importance of motivation, and, in his career, he would put those lessons to good use.

Willie enjoys talking about his parents and Mr. Harry, who was his neighbor. Willie’s parents had no formal education, but, when he was a child, he thought they were the smartest people in the world! His mother told him to get a formal education, and to go to college to



obtain a bachelors degree. She promised that she would obtain a high school diploma and graduate from high school with him. This seemed curious to him, as he thought she was already smart and knew everything. His mother always wanted him to further his education, so that he did not have to work in low-paying positions.

Enter Mr. Harry: Mr. Harry lived a few doors down from Willie and his parents. He rode a bus every day in order to work at the shipyard in Charleston. This bus transported African American men to their workplaces, most of which were in Charleston. Willie remembers that Mr. Harry made a lot of money, \$30,000 to \$40,000 in the late 1960s and early 1970s. Willie thought Mr. Harry, like his own parents, was one of the smartest guys on the planet! He had a television when few people owned one. He would purchase the Charleston News and Courier (now the Post and Courier) and would watch the news with anchor Walter Cronkite – only Walter Cronkite. He could tell you everything that was happening in the news. Moreover, he always encouraged kids, including his own, to go to college, and they did. At the age of 50, Mr. Harry went to apply for his driver’s license, and Willie was discovered that he couldn’t read. “That man knew everything about everything in the world,” says Willie, but couldn’t read.

When Willie began working in school administration in poor school districts, he took on the task of communicating with parents about their kids’ continuing education. He asked parents to assist their children in obtaining a formal education beyond high school. According to Willie, “if you get a child to focus on academics, they don’t have time to get into trouble.” Willie’s career has always involved getting kids to focus on academics, even “tough” teenagers and those who are challenged. In fact, he shuns statements from colleagues about “bad kids.” His success with students, in large part, has been because he builds relationships and motivates them – just like he was motivated by the loving and familial relationships of his parents and Mr. Harry.



**Joyce Hilliard-Clark**

**Joyce Hilliard-Clark** paused during our testimonials to affirm the common threads that resonate with all of our stories. Like others, her career in the sciences began with skills and a passion for the subject of math. Her algebra teacher was also her typing teacher. Fortunately, her teacher advised Joyce to pursue math, not typing! But for Joyce, high school calculus was her gatekeeper.

Joyce was the oldest in her family and the first to attend college. She grew up in rural, agrarian Nash County, a North Carolina community. Because she was the oldest, her family expected her to be a role model for her siblings. In fact, in these and other situations, when Joyce could be “in charge,” she was in her element!

The water was off limits to Joyce. Because of her segregated environment, she could not go to the beach. Joyce thought that people who fished were uneducated. Even with Joyce’s isolation from the water, and perceptions about people who made their livings from the water, it was her high school biology teacher who helped develop Joyce’s interest in ocean and biological sciences.

Her parents, like many their age in the South, were tight-lipped about racism. Segregation was a part of her existence. Joyce recalls an experience that made segregation personal and direct. Joyce tried to enter a movie theater, but the ticket seller told her that she could not get in. The employee did not know how to tell Joyce that blacks could not enter the theater, or, if they did, they would have to be seated in the balcony.

Amid this isolation, Joyce drew upon the culture of her paternal and maternal family to inform her humanity and her work ethic. She remarked that the “Hilliard part of me is stronger than the Clark part.” Her father owned land, and both parents were farmers. Joyce remembers that her father worked Joyce and her siblings “slam to death!” Her father wanted Joyce to come back home to work on the family farm during the summer, but she chose to enter (against her father’s wishes) Bennett College, the all-black, private women’s college in her home state. Joyce graduated early from Bennett College with an undergraduate degree in biology. However, she needed to earn a living, so she entered the world of banking as a head teller. Joyce used her math skills and “taught white guys how to do their work!” Discovering that banking was not her career path, she matriculated to North Carolina A&T State University, where she earned a Masters in Biology Education.

Joyce was later accepted into the biochemistry program at North Carolina State University (NCSU). However, when her professor spit in her direction, she left that program and entered NCSU College of Natural Resources, where she became the first African American to earn a Ph.D. She attributes her success to divine intervention, family, and the support of fellow graduate students. Today, as Coordinator of the Imhotep Academy at The Science House at NCSU, she uses her own determination, expertise, and experience as a math and science teacher to make a difference in middle and high school students’ grasp of mathematics, science and technology.

Joyce taught in one of the first integrated classrooms in her community. Although she had taught for nine years, she became disenchanted with the methods that administrators used to teach unmotivated students. “When you’re a great teacher, they dump all of the bad kids on you,” says Joyce. She grew tired and lost some of her excitement for teaching. Joyce continues to be distressed by the hopelessness that she sees in young people.

Joyce knows how crucial teachers are—she is one. But the challenge, today, she believes, is that parents are too busy for their children – even parents who are educated and “know better.” An additional challenge, Joyce believes, is that children think education should be easy. “This is unfortunate,” says Joyce. “Sometimes when things are too easy, there is little value in them.”

Joyce is also critical of the educational “system.” It is a system that people trust, “yet the system isn’t to be trusted ... it is not helpful for people of color.” As a result of these beliefs, her struggle is in discovering ways to motivate students and empower young people to see themselves as “winners,” as well as to inspire and empower parents to hold the educational system accountable. These obstacles may seem insurmountable, but they are not. Joyce still gets excited about creating opportunities to excite her students! Joyce believes that, if we give students “a wealth of choices and exposures,” then we’ve found at least one ingredient that is likely to sustain the interest of underrepresented students in the sciences.



**Dionne Hoskins**

**Dionne Hoskins** always had an association with the outdoors. She was born in Hampton, Virginia, to a family in which college was an “expectation” for her and her sister. Her parents had attended college and her grandfather had a bachelor’s degree in agriculture. Dionne grew up as a part of three generations of a solidly middle-class family. Her father was from Wilson, North Carolina and knew where to get good barbecue! Her grandmother (on her father’s side) fished every day. Dionne moved to Cleveland, Ohio, to Detroit,

Michigan, and to Lexington, South Carolina, before settling in Savannah, Georgia.

She grew up in a Savannah neighborhood that was created partly as a product of white flight. The neighborhood, however, remained predominantly white until the late 1990s. In an ironic twist of fate, she was bussed to all-black Beach High School, a school with origins analogous to Avery in Charleston. She reclaimed the irony: “I desegregated an all-black high school from an all-white neighborhood.”

On Saturdays, Dionne and her mother would go crabbing and shrimping. “For \$18 a month in amenities, you had access to the pool and a key to the gate with a private dock,” says Dionne. She remembers being fascinated by dropping the shrimp net and then discovering something in it. “We would find eels, pipe fish, all sorts of things ... I had the killer aquarium in high school.” She liked being outside and getting dirty, but does not feel that she was predisposed to oceanography. In fact, she failed the oceanography module in grade school. “I just grew up around the water and liked the stuff in the water,” she says.

In school, Dionne was, as she says, in the “smart kids program.” She was in AP courses in high school, and, as a part of an English assignment, she was required to apply to predominantly white, special interest, historically black, and Ivy League institutions for college. As a part of the assignment, she had to declare her major. Although she was good at biology, she was less interested in English or history. Besides, her sister was already majoring in print journalism. She wasn’t particularly interested in pre-med, nor did she want to study humans. She believed that “humans weren’t going to be endangered by my not studying them.” But she had an interest in marine and environmental science.

Dionne’s father wanted her to go to Savannah State University (SSU). He had read a local newspaper article stating that the university had built a new marine biology building. She could get a scholarship at Savannah State for \$1,000. He figured that, if she scored well on her SATs, she’d need \$542 for tuition per quarter, about \$300 for books, and would still have a little left over. Then he wouldn’t have to pay for anything! He began encouraging her to consider marine science. They compromised—if she attended SSU and considered majoring in marine science, he’d allow her to try out for cheerleading. Dionne admits that, in making her decision, she was “program and resource-driven, not necessarily mentor-driven.” She was unaware of efforts to attract minorities to marine sciences and explains, “I didn’t know we were endangered.”

What enabled her to make it? Looking at her undergraduate and graduate experience, she responds that experienced, active faculty who did their jobs became one of the ingredients of her success. For example, she cites the rigorous schedule set by her doctoral advisor. They met every Monday morning at 10 o’clock. She admits starving and struggling, trying to make ends meet in the absence of resources, but their connections exposed her to funding opportunities. Dionne received guidance on upcoming obstacles (e.g., help preparing for the Graduate Record Exam). There were people in her life “who anticipated my goals and obstacles and prepared me,” she says.

What is her perspective on race? “Race is irrelevant to performance,” she declares. “Performance is based on aptitude and preparation. Race is something we as Americans carry around as baggage. Being black has nothing to do with whether or not I have a predisposition to being able to understand science. Race does have something to do with the kind of resources that some of the institutions had. Race plays a role with the resources that people get. Race is an artifact of our sociology,” she adds.

What is Dionne’s philosophy on diversification and multiculturalism in marine science? “It’s really about jobs, democracy, self-governance,” responds Dionne. “It’s not about black rage, brown or red disenfranchisement, or white guilt. It’s about having jobs for people and managing our resources.”

Dionne offers an example of this philosophy based on random sampling. “What’s the use of a large sample size? It is that the more samples you process, the closer your distribution gets to being normal, a “bell-shaped curve.” The more inclusive we are, the more our decision-making processes and perspectives are going to balance out what is reflective of the normal society, or what is skewed by socioeconomic or cultural lines.” The advantages of diversity, she believes, move us toward a “normal” society.

Dionne shares a profound statement made by a girlfriend, Ava Phoenix, who was 20 years old when the two friends were pledging a sorority and pondering affirmative action. Ava posed the question, “Why should there be affirmative action?” Dionne didn’t have an answer. Another friend answered by saying that she was entitled to affirmative action but didn’t know why. Ava Phoenix, who today is a practicing OB/GYN physician, responded back then, “What if our great grandparents had access to education like others? What if, like others, they had jobs based on their educational attainment? What if we had experienced economic stability like others? What if we had experienced property inheritance like others? Where would we [African Americans] be in terms of our economic development? Would we be having the issues, in terms of demographics, that we’re having?”

Dionne concluded with a query: “Why are we still imparting ownership of a marine science career to some cultures more than to others?”



**Paula Keener-Chavis**

**Paula Keener-Chavis** grew up in Charleston, South Carolina. Paula recalls a story that describes the familial environment in which she was raised. Her mother and father were driving down an old country road in Georgia. Her father saw a man walking in the road with no shoes, and he stopped, gave the man his shoes, and then drove home barefoot. “I came from people like that,” she explained.

Growing up in Charleston, Paula’s family always had a boat. When her family was at the marina on the boat, Paula would “schlep” around the marshes and the mud because she liked the “stuff”—crabs and other creatures—in the mud. She was curious to know what the “stuff” was. She recalls that her parents supported her initial interests in the marine environment and continued to support her as she pursued higher education and eventually, a career in marine science – a field, at the time, that was unconventional for women. Paula knew early on that she wanted to be a marine scientist. Like Lundie, she was the first of several females aboard a state research vessel. It was her first experience of being “a minority”—of being different among what had previously been an all-male crew and science party. Paula says that her parents were instrumental in supporting her sense of place in her life’s work—that place was the ocean. For Paula, a sense of place is important in understanding the coastal heritage and history of a region.

Paula’s sense of place was also rooted in segregation. She vividly remembers being in the fifth grade at Harbor View Elementary School when the schools became integrated. She remem-



bers it being “a big deal” for everyone except for her. Somehow, she managed to transcend the racial attitudes that were so prevalent during that time. From her experiences with the Math & Science Hub at the College of Charleston, to her position as the National Education Coordinator of NOAA’s Office of Ocean Exploration, Paula remains very deeply committed to, and passionate about, issues of equity, access, and the closing of the achievement gap for underrepresented students in ocean sciences.

**Ashanti J. Pyrtle** decided after watching Jacques Cousteau on television in the third grade that she would one day become a marine scientist! After making this decision, each year from third to twelfth grade, Ashanti conducted marine science-based research projects as a talented and gifted student in Dallas, Texas.



**Ashanti Pyrtle**

Although Ashanti did not live close to an ocean, a large river was located nearby. Unfortunately, because it was pretty contaminated, it was commonly known that “you never went near that river!” Throughout her third-through-twelfth-grade years, Ashanti was fascinated with dolphins. Due to the limited number of opportunities that she had to actually go and explore the closest beaches along the Gulf Coast, Ashanti decided that she would learn all that she could about the ocean and its inhabitants by reading books and magazines in Dallas’ local and central libraries.

Throughout her elementary and middle school career, Ashanti had encouraging and firm African American female teachers that supported her desire to work in the ocean. In particular, she recalls that her teacher for fourth through sixth grade, Martha Lee, who “you didn’t want to mess with,” expected each student in her class to perform well. All of Martha Lee’s students were expected to continue working hard after they completed her sixth-grade class, graduate from high school, receive college degrees and be successful in their chosen careers.

During the summer before sixth grade, Ashanti’s parents took her to Alabama to visit some of their Lions Clubs International friends (her father was an active member); their daughter, Beth Goodwin, would later become Ashanti’s first mentor in the field. Although she was different from Ashanti—a white woman with blonde hair—she nevertheless became Ashanti’s role model.

Ashanti attended desegregated schools from the seventh grade through the twelfth grade. The schools were roughly one-third Hispanic, one-third African American, and one-third white. Because Ashanti’s interest in the marine sciences was firmly cemented, she could not be persuaded to consider a career that some considered “more normal and/or well known.” During high school, she remained committed to pursuing a marine science career, even after her tenth grade year, when Ashanti suddenly recognized that, throughout all of her years of research, she had not identified one living African American marine scientist! In fact, up until that time she had only discovered one other African American marine scientist, Ernest Everett Just, Ashanti’s idol; he, unfortunately, was dead. Although still determined to pursue her dream in spite of this revelation, Ashanti was a little shaken after realizing that she did not know of any living person who looked like her and shared her interest in the ocean.



The University of Miami began recruiting Ashanti during her junior year in high school, but only offered her a partial scholarship. Fortunately for Ashanti, her guidance counselor insisted that she also apply to Texas A&M University–Galveston, an in-state school that offered her a full four-year scholarship. Ashanti had a tough decision to make. Her parents helped her make the decision. They said: “If you go to Miami, you will not be able to come home for Thanksgiving, only for Christmas. But if you go to Texas A&M University-Galveston, we’ll buy you a car!” Ashanti’s decision was made! She was headed to Galveston.

At Texas A&M University-Galveston, Ashanti found herself in an environment in which less than a one percent of the students were African American. She went from a rich and ethnically diverse student population in high school to one that was primarily dominated by only one ethnicity. During the second day of her freshman year, eighteen year-old Ashanti met her roommate’s father and was terrified by his racist remarks. The irony of this situation was that Ashanti’s parents, who taught her to always respect elders, had already left Galveston and driven back to Dallas. Ashanti found herself alone and challenged to “respect” her roommate’s parent and live with a person who felt free to share this person’s racist beliefs. But she endured. Ashanti became friends with her white suitemates, participated in the campus student government organization, and cultivated a group of friends, mentors, and professors that served as her support system at Texas A & M University-Galveston. Included among these individuals were only a few African American students and one African American mentor, Mr. Willie Crayton, Director of the Office of Multicultural Services. In fact, the last time Ashanti was taught a course by an African American or took a class with more than one other African American student was in high school.

Although Ashanti was initially uncomfortable about being the only African American in her college courses, she adjusted to this reality by the time she enrolled in her doctoral program at the larger Texas A&M University campus in College Station. Throughout Ashanti’s college career, she had many white mentors and friends – from beach surfers and skateboarders in Galveston to country western fanatics in College Station. Ashanti learned early on that it was important to look beneath the surface and accept people for who they were deep inside.

During the first summer of her graduate career, a Ku Klux Klan rally was held in College Station. It was this event, as well as several other experiences, that “brought her closer to God.” From her close proximity to a KKK rally, to being called the “little black girl” by one of her professors on campus, Ashanti was often reminded that she was “different.” When reflecting on the impact of these experiences, Ashanti remarked: “I only had two choices – be bitter or make things better. I chose to make things better.” Ashanti frequently had to “prove” herself. After doing so, she was usually accepted, but not before. Ashanti “proved” herself on several occasions in her college career. For example, because of her leadership potential, she became student body president at Texas A&M University-Galveston and the first African American to receive a marine science degree from the school. In fact, Ashanti made many “firsts” as an African American student during both her undergraduate and graduate school experiences.

Since receiving her doctoral degree in oceanography in 1999, Ashanti has been actively involved in marine science research and education at several institutions of higher learning, including the Georgia Institute of Technology, Savannah State University and University of South Florida. The collegiate experiences of today’s students are different from her own. Ashanti gladly notes that there are more people of color throughout a wide range of scientific professions that serve as positive role models for these students. “The times—they are a-changin’.” And that is a good thing!



**Jeffrey Robert**

**Jeffrey O. Roberts** chose to pursue the sciences for his career because several individuals supported him, including his father, who worked in structural repair engineering in the U.S. Air Force, and his mother, who was a seamstress. In school, Jeffrey's projects were so good that students thought his father had completed them! Little did they know that Jeffrey was mastering his own skills with careful guidance from his parents. In addition to his parents' support, Jeffrey had a white male teacher in his sixth and seventh grade years, Tom Bailey, who Jeffrey thought was really cool! Mr. Bailey taught a summer science enrichment program that Jeffrey's parents encouraged him to attend. When he entered middle school, Alberta Holder, his African American science teacher, became another support system for him—a very enthusiastic one, Jeffrey recalled. Prior to high school, Jeffrey only met a few roadblocks along the way – he was a very successful student of science, having taken every science and math class offered. But his high school guidance counselor advised him to consider work in the local shipyard following graduation. Jeffrey mentioned that similar exclusive practices—not recognizing the skills and potential of students or worse—are still common among guidance counselors today. “Guidance counselors are often the gatekeepers to many students’ futures. They can either preclude kids from pursuing careers in science, or nurture them to profound accomplishments,” says Jeffrey.

During the 1990s, when Jeffrey was teaching high school biology, Rashid, one of his students, entered a poster contest for the North Carolina Alliance for Minority Participation. Rashid designed a hologram for a hard drive, which could store 1,000 times as much as a microchip. Jeffrey reminds us that Rashid was only 16 years old, but the professors at UNC-Charlotte thought he was a junior in college. Rashid was in such demand and his work was so well received (the Massachusetts Institute of Technology wanted him to work for them that summer) that Jeffrey advised him to patent his design with the U.S. Trademark and Patent Office. So, what did Rashid eventually do? He went on to attend Fayetteville State University and became quite successful. As of this date, Rashid has graduated from Fayetteville State University in Computer Science and is presently working with a software company.

Jeffrey believes that the poster contest and the trip to UNC-Charlotte really made a difference for Rashid. He also believes that it isn't always about “the ethnicity of the teacher, but it's more about caring and opening up resources to facilitate a child's growth and development toward the realization of their aspirations” that makes the difference in student achievement. One person who cares, who personally guides a student and provides him/her with experiences that improve their skills, who will promote their work to colleagues and peers, and who offers the resources to accomplish benchmarks in students' lives, is what Jeffrey believes are the catalysts to student success. Jeffrey is comfortable being an African American male guiding and shaping a diversity of students' lives in his work in science education. “Our focus in this endeavor must revolve around the new three R's: relevance, rigor, and relationships.” The axiom “each one, teach one,” coupled with truly high expectations, is the most effective approach to recruit and retain underrepresented students. In the words of James Comer, “no significant learning occurs without a significant relationship.”

**Andrew (“Andy”) N. Shepard** grew up in Hartford, Connecticut, nearly two and one-half hours from the beach. He visited the beach and state parks during his childhood. But it was Jacques Cousteau's television specials that attracted him to ocean sciences. In fact, Andy loved

the ocean and rocks from eight years of age on. His life long goals are to create similar experiences for students and to get parents and teachers involved in this quest. Andy recalls that one of the most exciting programs for him was establishing a diving program for African American students at Grays Reef Natural Sanctuary that was connected to a program run by Matt Gilligan at Savannah State. Because of the lack of money and other resources, only one student finished the program, but felt isolated.



**Andy Shepard**

This was frustrating for Andy. He believes that there are three key problems to retaining African American students in the ocean sciences: (1) funding, (2) lack of critical mass, and (3) sense of isolation. Andy's example poses this question for us: Do we create programs that attract minority students, and then back away from implementing a holistic infrastructure that helps to ensure their academic and cultural success? Creating effective models of community building is an essential step in establishing programs for underrepresented students. An academic structure is not enough; students are cultural beings and come to us full of familial, economic, social, emotional, and historical experiences. Our programs must be built on these cultural understandings of our students, if they are to succeed.

**Lundie Spence** was born in Richmond, Virginia and grew up in Christiansburg, Virginia—a small mountain town. Her mother and father came from two very distinct cultures. Her father grew up on the Chesapeake Bay and in “Old Richmond.” He was well steeped in the vestiges and cultural remnants of the Civil War—“a true Virginia Gentleman.” Her mother grew up surfing—“a wild woman of sorts from Sydney, Australia.” Lundie's mother had no experience with the racial issues in America and had no interaction with the aboriginal culture in Australia. In Richmond, her mother was criticized by other young wives because, when her mother drove the housemaid back to her home, she wanted the woman to sit in the front of the car with her. Her life in Richmond differed from that of her social peers, and she influenced both of her daughters to think and act independently.



**Lundie Spence**

Although Lundie's mother supported her own mother and her mentally-challenged sister during World War II in Sydney, her greater challenge was the rigidity of Richmond society. As a result, Lundie's father moved the family west, where social pressures were less regimented. Her family was oriented to the water, so weekends and vacations centered about lakes, rivers, or the ocean. Her first experiences with marine life were with her dad.

During Lundie's grade-school years in Christiansburg, there were no role models of professional women in any science. She also experienced completely segregated environments, in school, church, and social activities. She admits to “never having talked to a black person of my age in my whole life” until she went to Florida State University for her Masters degree. There, she became curious about the black experience.

When she participated in graduate shipboard research in the late 1960s, it was only the second time in the history of that research vessel that women were on board. Lundie recalls the superstitions of the male crew, who thought that the ship would sink!

This research cruise made a number of impressions. But she was most amazed and uncomfortable when she experienced hostility from the research vessel's crew during a week that she spent socializing with Trinidadians of African origin in Port of Spain. She remembers enduring total isolation from the crew and most scientists aboard the all-white ship because she interacted with "all those black people."

Lundie later began a high school teaching career in Carrabelle, Florida—a town with only a post office and a police station. Although she had had numerous opportunities to conduct research, her first love was teaching. Also, like Joyce, Lundie's passion for teaching was dampened by administration and kids who were not motivated to learn. She wondered, "where is it that we feel we can make the greatest contributions?" Today, she is confident in what she is able to do to make a difference in students' lives in marine sciences: "I've never seen a door I didn't want to go through or a salt marsh to explore, and not pull about eighteen people with me!"

**Carrie Thomas** grew up in a small town of approximately 2,000 people in Central Illinois. Her family is of German descent, and all were raised as Catholics. In her town, people either farmed or worked in the factory that made parts for Caterpillar. Most people had the same socio-economic status, but she was raised without ever feeling that she was poor. Everyone lived the same way. It was not a big deal if a person wore hand-me-downs; everybody did.



**Carrie Thomas**

Carrie loved nature, and she wanted to be a farmer. She had one sister and loved it when things broke around the house. It was fun time! Her dad enjoyed fixing things, making them better than they were before they were broken.

But during the 1980s when Caterpillar began massive layoffs, the economy dipped, agriculture began shifting, and her family decided to move to Charlotte, North Carolina, where her father landed a really good job. The move was a culture shock to her family. Her parents had exposed Carrie and her sister to different sights, sounds, and tastes—but the South was a world they had not really experienced. Carrie and her sister changed from attending a small high school to a very large one. Carrie remembers being intimidated by the very size of her new high school.

She interviewed at a college where she wanted to major in agriculture. But an admissions counselor advised her that more scholarships were available in the marine science department; Carrie agreed to consider a different degree. As a result of that admissions interview, Carrie's life changed dramatically. She has traveled all over the world.

During her college years, she had few barriers in her academic work. Her undergraduate class environments were fairly well integrated in terms of gender, but not race. Her graduate classes were with all white males. She has horrible stories of situations with sixty year-old white men, other jerks with thoughtless comments, and stories of men in her career who have been super helpful to her. She chooses to "save us from hearing those stories." But she concludes that she has had helpful mentors, as well as potentially destructive jerks, along her academic and career path. She has lived both sides. But she believes that taking the bitter with the sweet, analyzing, adapting, and making choices is what life is about.



At North Carolina State University, Carrie works with students who constantly struggle with finances and career choices. Although she doesn't always know what to tell them, she embraces them in her own way: "I have a house that's messy, but you're invited into my house. I'll share it with you," she tells students. In this way, Carrie acknowledges that resolving problems and finding solutions to students' difficult challenges can be a messy process. But if students know that someone is there to invite them in, to help them, even in the midst of the mess, that alone can be comforting. "Your 'home' may well be the only sense of place they've been invited, or that they're comfortable in," she says.

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### What we learned from our stories

Vivian's testimony, and that of others in the group, revealed an important concept: if barriers exist that limit involvement for one group of people, then all groups will face barriers of some sort that limit full participation. As educators, we must be strong advocates and excited about our work, even when that work moves us past our comfort zones.

#### Continuing the Charrette process

Throughout the testimonials, Vivian encouraged us to think about several issues that are central to our work in attracting and retaining underrepresented students in ocean sciences programs. First, as we "invite" underrepresented students into our programs, we are obligated to keep them from entering a hostile environment; if the environment is hostile, we should not abandon them. Second, we should leave this charrette knowing that creating relationships is the vital "deliverable" we take from this event. Our students will trust us, and not feel abandoned, only to the degree that we model a multicultural environment for them. Remembering that our students are disadvantaged when they are in isolation should guide our work in building healthy relationships with them.

#### The Village: Avery Center

Discussing the historical legacy and current mission of the Avery Research Center was an important task for our charrette. The prominence of many of this region's residents, and the unparalleled skill, talent, and leadership of enslaved and free blacks, has produced an unprecedented South Carolina Sea Island culture. The region's residents have also had a hand in slavery, civil war and reconstruction, civil and women's rights, education, business, and the arts. It is Avery's mission to preserve this vast legacy.

The Center's facilities occupy the building that once housed the Avery Normal Institute. Founded in 1865 after the Civil War and during the tumultuous Reconstruction era, the nationally recognized Avery Normal Institute trained Charleston's young African American adults in professional careers and leadership roles for nearly 100 years. Although the school closed in 1954, many of its graduates carried on the tradition of educational excellence and community leadership by organizing a community-based historical society in 1978 – the Avery Institute of Afro-American History and Culture, Inc. In 1985, with the assistance of the Avery Institute and the College of Charleston, the Avery Research Center was established.

Several permanent installations have been developed at the Center that highlight the uniqueness of the South Carolina Lowcountry and the surrounding sea islands. Among the



Center's permanent displays are: The Sea Island Artifacts exhibit, which shows the impact of the slave trade on this region and on the subsequent retention and survival of African language, music, crafts and foodways; The Avery Room, a recreated 19<sup>th</sup>-century classroom utilizing period furniture and reproductions to chronicle facets of the Avery school experience; and the Philip Simmons Exhibit Area, where a celebration of the work of the venerable master blacksmith and his enormous contributions to the architectural history of Charleston and the Lowcountry is shown through his exquisite wrought-iron constructions.

Both Avery and its peer institution, the Penn Center on St. Helena Island in South Carolina, serve as important centers in the Southeast region for COSEE SouthEast. These institutions preserve the last remaining vestiges of African culture that were displaced during the horrific crossing of the Atlantic Ocean. The transatlantic slave trade forced African children, mothers, fathers, the unborn, and the elderly to the coastal areas of the mid-Atlantic and the Southeast, where they were sold into a legal economic system of slavery. To fully understand African American culture along the Southeast coast, one must understand its relationship to the ocean. Avery and COSEE SouthEast's work documenting this history and providing resources (via Avery's archives) to ocean science educators promises to be an important step in fulfilling COSEE SouthEast's mission.

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### Section 5: Ideas from the Gathering

As in any village, people gather to identify issues and solve problems. The charrette began with a seeking of ideas for anticipated products or deliverables for COSEE SouthEast. Vivian focused our efforts on achieving consensus regarding at least one anticipated product, including the strategies necessary to accomplish that goal.

The ground rules that Vivian established were essential. When we leave here, our work should answer the following questions: What did we accomplish? What didn't we accomplish, and what did we accomplish in its stead?

Vivian also asked us to consider issues that we routinely accept, but rarely examine: our reason for existence. She directed us with specific questions. Why are we here? What did we make a commitment to do? Are we moving in the direction that would maximize the possibility of doing that which we made a commitment to the funding source to accomplish? Vivian concluded that such a framework – examining mission, practice, process and policy, and constituencies – is helpful.

The following are four focus goals identified by the participants.

1. *COSEE SouthEast will focus on the North Carolina, South Carolina, and Georgia region. We are bounded geographically. What we do here will be shared with the nation, with the National COSEE Network, and with other entities that choose to examine our work and explore how they might use or apply our work to populations that might have not traditionally been involved.*
2. *COSEE SouthEast will work to forge stronger relationships between [and among] research organizations, researchers, schools, and informal educational sites in the region.*

Vivian suggested that we parenthetically insert “and among” in this COSEE SouthEast goal and expectation. Do we know what research organizations exist in our three-state region? Is there a database? Do we know who the researchers are, and who are the ones we wish to engage? Do we consider a researcher a person with an earned doctorate, one who is a member of a larger community with interests in special topics, and one who does “kitchen-top” research? Will our work include the research and efforts of “layfolk” who may not be in the academy but who can provide cultural legitimacy to COSEE SouthEast’s work?

When we refer to “schools,” do we mean pre-K-12, K-12, beyond 12, higher education institutions, charter schools, private schools, and the public school systems? Who are the people in informal educational sites? What do these sites look like? Forging relationships with research organizations and informal educational sites in the region will include centers like the Avery Research Center. Vivian recommended that Avery and other such centers (such as Penn Center on St. Helena Island) be considered as a “storehouse” or repository for the cultural products of COSEE SouthEast’s work. Creating programs based on the unique African American coastal heritage in our region allows for COSEE SouthEast’s work to be culturally refurbished in Avery’s archives.

Vivian reminds us that, before we can forge stronger relationships with other constituencies, we need to know who these audiences are.

3. COSEE SouthEast will reach out to underrepresented groups in the ocean sciences (African Americans, Hispanic Americans, Native Americans/Native Alaskans, and persons with disabilities) by first creating programs based on the unique African American coastal heritage in the area.

Vivian guided our conversations about our intended audience – the population with whom we will work. Who are our underrepresented groups? What is COSEE’s unique contribution to these ethnic populations? How are we validating these groups in our work? As a result of our work, in what populations might we see a difference? Vivian strongly suggested that we move away from patronage and paternalism, toward engagement rather than outreach, so that we can forge relationships, and that we move closer to “us” and away from “them and us.” Taking such steps offers us an important and more inclusive cultural framework than a more traditional and narrowly-focused cultural paradigm.

4. COSEE SouthEast will undertake basic activities
  - a. *Inventory of existing ocean science materials and programs.*

Is there a rubric and criteria in place for an inventory? Does or will the inventory include the work of laypeople outside of the academy (e.g., neighborhood preservation societies, those who care about the flora) who have amassed vast resources and information that can provide legitimacy and cultural connections for us?

COSEE SouthEast has already begun work on an inventory. Andy suggested that the inventory, like the Web site, is a priority item from which innovative programs might be structured. Vivian challenged us to consider how we might catalog our inventory – how we might make the data accessible and usable.

- b. Awareness workshops for educators and researchers

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## Section 6. Finding Commonalities from Gathering

In her essay, “The Site of Memory,” Toni Morrison, one of our country’s most prolific writers and the 1993 Nobel Laureate in Literature, spoke of water as an important aspect of remembering our cultural history:

The act of imagination is bound up with memory ... All water has a perfect memory and is forever trying to get back to where it was. Writers are like that: remembering where we were, what valley we ran through, what the banks were like, the light that was there and the route back to our original place.

From our idea-gathering, queries, and the framework for our work based on COSEE SouthEast’s objectives, charrette participants engaged in an enlightening conversation about the cultural, ethnic, and regional-heritage issues that would be the context for our work. The following is a summary of that free-flowing conversation, which laid the groundwork for specific tasks and initiatives the group would later consider.

*Visual Imagery:* The Native American “bow and arrow” was offered as one visual image to symbolize COSEE SouthEast’s work: the bow for the focus of our work, and the strength of our cultural vision; the string for the relationships we will forge; and the quiver for our focus, selections we will make, and tasks and activities that we will involve ourselves in. This symbolic reference and the following important statement provided a context for our discussion: cultures do not operate in isolation.

*Maritime Traditions:* The group discussed the need for COSEE SouthEast to identify the ties to, and cultural issues in, each of the three states’ coastal heritage. Examples include the expert seafaring and boatbuilding practices among the Kru of Liberia, a region once called the Pepper Coast located south of Sierra Leone, that explained the canoe-and-boat savvy of many enslaved Africans in South Carolina; the similarities and differences of basketmaking in the coastal areas of North Carolina, Georgia, South Carolina, and even Florida, and the uses of basketmaking in U.S. coastal living as compared to West African countries; similar plant life in South Carolina, West African countries, and the Caribbean; the similar topography of the Caribbean, coastal Georgia, southeastern North Carolina, the sea islands of South Carolina, and coastal areas of West Africa; and the retention of indigenous West-African foodways, language, and religious practices that have survived in the three-state region of COSEE SouthEast.

### Charrette Participant Comments:

These ethnic and regional connections were enhanced by a discussion of regional issues that help to define our cultural selves. Dionne explained that being African American is only coincidental to the fact that her grandmother went fishing every Wednesday in the Chesapeake until she died in Virginia. The commonality that is shared with those living on the southeastern coast is that you eat the seafood that is nearby. And this common heritage, she believes, is coastal, not necessarily ethnic. Dionne cautions us to avoid the tendency to partition ethnicity as a separate issue and then translate and apply it to an ocean science construct. “It doesn’t have to get Africanized or Native Americanized for us to sell it to our constituency.”

Carrie agreed that, for her, geographical issues help identify one’s heritage. She believes that COSEE SouthEast should pursue questions of cultural heritage from regional points of view;

for example, why have many of us remained on the coast, and why are food, moderate climate, water, and other coastal resources so valuable to us now and in the future? COSEE SouthEast should uncover rich examples of our heritage based on “cultural geography” that will attract students and teachers and will make ocean-science learning more relevant in their lives.

This point of reference that both Dionne and Carrie discussed is an important one. Likewise, Paula shared a finding from a published article: unless African Americans had some contextual experience on the coast or the water, the possibilities of their entering the field of ocean science were slim.

Another point of view, however, is that teaching students from their ethnic perspectives and in an interactive way that “relates to them,” stated Jeffrey in our discussion, connects them to who they are, instills confidence, and enhances their self-esteem. Ashanti added that the richness of a culturally diverse ocean-science curriculum is one that embraces contributions different ethnic groups have made.

For example, an introductory class in marine sciences studying cell surface in the development of the organism might read and analyze one of nearly 100 published articles by the African American marine biologist, Ernest Everett Just. This could include his 1914 article on “Breeding Habits of the Heteronereis Form of *Platynereis megalops* or a 1940 article entitled “Fertilization-Reaction in Eggs of *Asterias rubens*”

(Manning, 1983). Or a high school class might learn that enslaved Africans were seamen who were often well-traveled and multi-lingual, that Robert Smalls of Beaufort, South Carolina, commandeered a Confederate steamboat for the Union army, or that the pioneering commerce and navigational skills of Charleston’s Mosquito Fleet, a group of African American fishermen during the early 1900s, provided seafood for many Charlestonians. *Black Jacks*, a seminal work by author and bluewater sailor-turned-historian W. Jeffrey Bolster, might be included in a course bibliography on ocean sciences; this book documents African American seamen in the age of sail. Charles Johnson, author of *The Middle Passage*, has written, “*Black Jacks* places sailors of color squarely at the center of Atlantic maritime culture.”

This discussion not only provided an exchange of similar regional/coastal commonalities among participants, but began to define one approach to cultural diversity that COSEE SouthEast should consider in its work. Embracing ethnic and regional perspectives with the cultural heritage of the southeast is a legitimate context for our work.

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## Section 7: Results of the Gathering—Coming to Tasks

Two members of the Charrette, Dionne Hoskins and Karen Chandler, facilitated a session to assist COSEE SouthEast in developing a working inventory of regional resources. The results indicated that an inventory should identify individuals in our target audience – partners, collaborators, and other stakeholders – who should be, or could be, associated with efforts addressing underrepresented populations.

The group determined that the establishment of a database and process to access best practices among the people, programs, and information of underrepresented populations or those who serve and work with these populations, would be one of COSEE SouthEast's first priorities. In this way, the database can be retrieved by other COSEE programs in order to engage underrepresented populations in COSEE's larger ocean-science community. In essence, the compilation of this inventory would not only be useful for COSEE SouthEast – and a first step to completing other tasks identified in our goals – but the inventory and the process would also help other COSEE programs replicate an inventory in their own regions.

The participants broke into working groups to address the following questions:

- (1) Who are the researchers (ocean, environmental, and atmospheric) of underrepresented populations, or who work with such populations in COSEE SouthEast's three-state region?
- (2) Who are the educators and the formal and informal programs (such as workshops and professional development opportunities) in K-12 schools, higher-education institutions, educational and professional associations, community-based organizations, and informal educational entities (e.g., aquaria) who work with, and are interested in, underrepresented populations in COSEE SouthEast's three-state region?
- (3) What are the appropriate materials and other resources that deal with underrepresented populations in COSEE SouthEast's three-state region?

**Task Group #1** – *Who are the researchers (ocean, environmental and atmospheric researchers) of underrepresented populations or who work with such populations in COSEE SouthEast's three-state region?*

Group 1 (Andy Shepard, Carrie Thomas, Karen Chandler, Sue Cook) identified their task in a mission statement that includes goals of COSEE and the group's assignment. The mission statement is:

The Research Task Force is an effort of COSEE SouthEast that develops and maintains a resource in the form of an inventory of social and pure science researchers, as well as “non-traditional” researchers (e.g., cultural heritage researchers, genealogists, anthropologists, authors, historians, and parks and recreation researchers). The inventory includes information about researchers' function in, and contribution to, the COSEE program. The overarching goal of the Research Task Force is to build bridges between researchers (as broadly defined above), educators, and students that are a part of, or who serve, underrepresented populations.



The following are tasks that the Research Task Force identified for their work:

1. The current database should be expanded to include the following researchers:
  - humanities and social science researchers
  - non-traditional researchers that include cultural heritage researchers, genealogists, anthropologists, authors, historians, and parks and recreation researchers
2. The group determined that COSEE SouthEast should identify at least five people and organizations from this network that should be included in the database, why they should be included, and in what capacity.
3. The group discussed who would use the inventory and addressed the technological format that would provide easy access. The format of the inventory should include appropriate software that can be easily changed into a Web front end, such as Filemaker Pro. The group identified other questions to consider. Will access to the inventory be password protected? Who will be the Webmaster for the inventory?
4. The group discussed two key needs: (1) the sustainability and maintenance of the database (e.g., what will be our plan to take care of this inventory as the project evolves); and (2) the development of a literature survey and statement of challenge.
5. The group discussed potential applications for the inventory, and developed four specific applications (e.g., coincident criteria for paring down the inventory) which include:
  - a. E-mail Question and Answers
  - b. Mentorship (virtual and other mentors)
  - c. Partners (joint researcher, educator, and historian partnerships to, for example, develop projects and proposals collaboratively)
  - d. Communications efforts allowing individuals in the network to communicate with one another regarding classroom visits, presentations, and workshops. Such an effort would assist classroom teachers who, for example, may need someone to come and talk to their class.
6. The group outlined survey items to be sent to researchers for the inventory similar to the one Jennifer has sent to educators. The survey would include a list of people and their research interests. A survey effort might include a workshop to develop tools and to take advantage of existing expertise. Information that might come out of such a workshop could then be used to pare down the inventory.
7. The group brainstormed Web site ideas and discussed external funding opportunities for the development of a Web site. COSEE SouthEast was funded because of the different approach it would take from other COSEE programs (e.g., displacement of a history of people, particularly African Americans, of their heritage from the coastline by coastal development, displacement of African American gravesites, the Middle Passage, land development and use via work with the National Park Service, etc.); therefore, COSEE SouthEast's Web site could show how its approach is captured in a GIS Web-based product. Web site and grant proposal ideas included:
  - a. various web pages that would focus on regional issues so that users can identify the people and resources that are "local" to them; faces of maritime history and research (e.g., biographies and links to sites like Avery and the Penn Center); differing perspectives on resource values (e.g., how much value does a coastal island have? How might a developer and local families envision different plans for a high-rise condo?); educational links; and multiple portals

that are user-based (i.e., for teachers, students, researchers, “curious folk,” etc.)

b. immediately investigating grant deadlines at the National Endowment for the Humanities (NEH), National Park Service (NPS), and the Coastal Services Center (CSC).

A. Accomplishments to date:

- a directory of oceanographers, marine scientists, environmental consultants, regulators and policy makers; and
- a questionnaire to survey researchers in the directory to identify their potential for involvement. This directory represents the first phase of what is intended to be a “true” inventory based on questionnaire responses rather than a directory listing.

B. Short-Term:

- expand the directory by adding non-traditional researchers (Carrie with assistance);
- finalize and administer the survey (Carrie with assistance and regional input);
- identify funding opportunities, especially those specific to Web site development and cross-disciplinary efforts, such as NEH grant opportunities that focus on history where science might be a cross-discipline, CSC, NSF, and NPS (coordinated effort between Andy, Karen, Lundie and Carrie); and
- develop interactive, Web-based front end for the inventory (the group will need suggestions for software).

C. Mid-Term:

- use the results of the survey to pare down the inventory and follow-up with individuals who show the most promise for participation;
- formalize the commitment of partners;
- create literature surveys on coastal development and the impact on coastal communities (Andy), specific examples of the displacement of communities, historical sites, national monuments/landmarks (e.g., Middle Passage and the transatlantic slave trade – the Atlantic as an African graveyard, and other historical-cultural issues that connect with the sciences using history as a “hook”) (Karen with NPS researchers via state-by-state);
- address cultural and attitudinal barriers that prevent young people from choosing science and marine science as an attractive career. Address common myths, wives tales, and urban legends;
- identify funding opportunities and write proposals; and
- meet with the National Park Service to learn about their cultural heritage efforts and to develop a partnership plan during the Fall to bring them on board

D. Long-Term:

- use materials developed to provide resources and people for the Coastal Legacy Program;
- self-assess, revise plan, and develop new action items; and
- continue to work to fulfill objectives in the NSF proposal.

**Task Groups #2**—*Who are the educators and the formal and informal programs (e.g., workshops and professional development opportunities) to which educators are connected in K-12 schools, higher education institutions, educational and professional associations, community-based organizations, and informal educational entities (e.g., aquaria), and that work with and are interested in underrepresented populations in COSEE SouthEast’s three-state region?*

Group #2 (Jeffrey Roberts, Willie Frazier, Jennifer Jolly Clair, and Paula Keener-Chavis, Albert George, Dionne Hoskins, Sheila Brown, Ashanti Pyrtle, and Lundie Spence) decided to build on the existing inventory database, which has identified 300-plus ocean science researchers. The current database should be expanded to include specific people, agencies, and organizations with diversity interests. One task is to develop some strategy to reach minority-serving institutions or consortia in South Carolina, Georgia, and North Carolina, identified programs that currently serve and engage underrepresented groups or that coincidentally do so via mainstream programs, indicate where such programs are located, and list the agencies that fund them. Another task is to compile a list of funding sources with a history of supporting diversity programs.

1. The following are potential and existing funding agencies that support minority programs:
  - Gas companies, corporate sponsors, and businesses that make money in North Carolina, South Carolina, and Georgia
  - Georgia, North Carolina and South Carolina Departments of Education
  - U.S. Department of Education
  - National Science Foundation
  - Environmental Protection Agency
  - Department of Energy
  - Department of Natural Resources
  - NASA
  - SEER (Department of the Interior)
  - State Departments of Science Supervisors
  - USGS
  - U.S. Fish and Wildlife
2. The group discussed identifying informal and formal programs, and the educators and researchers who serve as the grant programs' principal investigator by tracing the programs via the program officers of the agencies and foundations who funded them. The following are some programs the group identified:
  - GLOBE - <http://www.globe.gov/>
  - JASON Project— <http://www.jasonproject.org/>
  - EIC (Environment as an Integrating Context for improving student learning) <http://www.seer.org/pages/eic.html>
3. The following organizations have an awareness of minority involvement in the sciences – ocean, professional, education, and other types of organizations – that both groups will tap to assist COSEE SouthEast with recruitment and dissemination of information in the inventory:
  - North Carolina's Historically Minority College and Universities Consortium (12 or 13 in North Carolina)
  - 21<sup>st</sup> Century Learning Center Grants (College of Charleston representative)
  - National Alliance of Black School Educators
  - University of South Carolina's Minority Engineering program
  - National Center of Culturally Responsive Educational Systems. This entity might assist us in finding pedagogical resources for teaching culturally and linguistically diverse groups (e.g., how do non-minority teachers teach cultural topical issues to underrepresented populations?) (Jennifer)
  - College of Charleston's GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Program) – The COAST Team has worked with GEAR UP, a summer program

that serves mostly minority students in the Charleston area, and will use COSEE SE SouthEast's curriculum. GEAR UP is a national program funded by the U.S. Commission on Higher Education. The groups will locate similar programs in COSEE SouthEast's three-state region that will allow us to include a marine science component in their curriculum.

- Key people at historically black colleges and universities (HBCUs) in COSEE SouthEast's three-state region, including South Carolina State University, Allen University, Benedict College, the HBCU consortium in Georgia, and the Atlanta University Consortium
- Avery and Penn Centers
- South Carolina, Georgia, and North Carolina State Departments of Education and the U.S. Department of Education
- North Carolina Biotechnology Initiative
- NSF resources for minority-serving organizations
- NOAA's program for minority-serving institutions
- Utilize teachers and officers of Junior Officers in Training Corps in the three states to take part in our workshops and to get students shipboard experiences
- National and Regional Ocean Science Bowl
- NAFEO (National Association for Equal Opportunity)
- NAML (National Association for Marine Laboratories)
- SAML (Southeastern Association for Marine Laboratories)
- JOI (Joint Oceanographic Institute)
- Boys and Girls Clubs
- Scouts (boys and girls)
- Private and parochial school organizations
- DLESE (Digital Library for Earth Science Education)
- Foundations that fund educational activities (Packard, Kellogg, Carnegie)
- Religious organizations
- National Academy of Science
- National Oceanographic Partnership Program (NOPP)
- National Association of State University Land Grant Consortium (NASULGC)
- Honor Societies
- Museums and Aquaria

Following the group's identification of institutions and key people who could fulfill a partnership with COSEE SouthEast, they outlined their tasks in a timeline:

### A. Short-Term:

- COSEE SouthEast staff should tap into the above-mentioned organizations within the three states, make organizations aware of COSEE SouthEast's goals and objectives, and form partnerships. The outcome of this effort should be to answer the following question: How can COSEE SouthEast support their goals and objectives, and expand COSEE SouthEast's goals?
- Hire a graduate student to assemble this list and make contact with the above-mentioned organizations
- Catalog an inclusive listing with COSEE-defined criteria based on quantitative measures (i.e., what programs have the most Web site hits, what programs are the most successful, volunteered information). The catalog listing might include a minority program or a non-minority program that impacts a large group of minorities

- Establish a long-term database format to best store and position collected data
- Devise a tracking mechanism to assess the development and use of the database system on the Web (hits, rewards) for teachers' programming
- Tap guidance counselors and their affiliated organizations in minority school districts within the three states. COSEE SouthEast should plan awareness workshops with counselors on marine science careers, and coursework that students need to take in order to go into marine science
- Consider taking the Avery staff onto research vessels to do photographic and oral history documentaries of students' experiences (e.g., Colleton county in ACE Basin)
- Consider developing a sample vertical alignment in each subject area that indicates what skills students need for careers in marine science, and impart this information to guidance counselors via awareness workshops (Jeffrey, with assistance from NMEA representatives for marine science in science standards)
- Leverage outside funding from gas companies, corporate sponsorships, and businesses that make money in COSEE SouthEast's three-state region (e.g., Philip Morris)

### B. Mid-Term:

- Establish a committee to review the list for effective, discontinued, or new programs
- Create an outcome statement that describes the benefit of this effort
- Create a virtual community of people who administer informal and formal programs and (a) have those interested in these programs use successful programs as templates; (b) identify trends in the marine education community (e.g., movement toward large programs with many students, programs that focus on shiptime, programs that are moving inland with many students, programs that focus on small cohorts rather than the individual); and (c) form a diversity discussion group similar to our charrette but larger and with a broader reach of constituencies

### C. Long-Term:

- Plan a series of awareness workshops to include an evaluation component, in rural communities and faith-based organizations (in churches) of how cultural heritage can be used to increase awareness of human ties to the ocean. Audiences would include K-12 teachers, parents, representatives from State Departments of Education, community, guidance counselors, mentors, and other COSEEs who might modify the awareness workshops for their regions.
- Provide, maintain, and promote a data resource list for the COSEE SouthEast network and other educational institutions and organizations. COSEE SouthEast has a comprehensive list for underrepresented groups, and this list should be highly promoted.

**Task Group #3** –*What are the appropriate materials and other resources (e.g., hard and virtual) that deal with underrepresented populations in COSEE SouthEast's three-state region?*

Group #3 (Sue Bowden, Joyce Hilliard-Clark, Brenda Chee Wah) discussed two primary and initial tasks that should be in place to assist with the completion of their task.

(1) Hire graduate students to complete this task and provide them with clear benchmarks and deliverables. Potential candidates might include those in internships with college and



university graduate programs or those with a vested interest in our programs and the goals of COSEE; and

(2) Contact The Bridge. Organization staff may be willing to create a section or searchable note for underrepresented groups.

The following are hard copy and virtual materials for target groups including K-12 teachers, undergraduates and graduate educators, community-based leaders of organizations, and academic researchers and educators. The materials are based on subject areas that include marine sciences, marine biology, oceanography, marine ecology, marine geology, marine chemistry, chemical, oceanographic, and environmental subject areas that Group 3 suggested would be appropriate to have as resources for underrepresented populations. They include:

- Marine magazines
- Marine/oceanography journals
- Brochures
- Science kits
- Ocean science models
- Pictures
- Posters
- Hands-on material and activities
- CD Roms
- Online Web sites, Web pages
- Radio/Television programs
- Videos, DVD
- The creation of new material that reflects multicultural formal and informal marine scientists and educators. New material might include videotaped interviews (oral histories), manuscripts, artifacts, photographs, maps and drawings arranged in a portable display and suitable for a variety of populations.

The group suggested the following sources to access these materials (it should be noted that the organizations noted by an asterisk (\*) include entities that could be contacted by Groups 2 and 3):

- Clearinghouses\*
- Cultural heritage sites within the three states\*
- HBCUs (Historically Black Colleges and Universities)
- Teachers' workshops to develop and create cultural heritage resources
- Contact personnel in each school
- Local Education Authority (LEA), including community leaders, historians, science coordinators, science curriculum facilitators, marine personalities and sea men, and curators among African American populations\*
- Museums
- Federal programs in wildlife and fisheries
- Environmental Protection Agency (EPA)
- National Oceanographic and Atmospheric Administration (NOAA)
- Sea Grant programs\*
- Private consultants of special interest groups\*
- Coastal fishing groups\*
- 4-H clubs\*

A. Immediate Goals:

- Identify and select two graduate students or researchers who have a vested interest in the goals of COSEE SouthEast to collect and collate data and materials, in addition to identifying persons with relevant marine science experiences available on the Web, and among the three participating states
  - Select format for data to be added to COSEE SouthEast's Web site as collected and collated
  - Develop a summer pilot workshop for teachers to create and develop new material. This material will attract culturally sensitive minorities to marine history and marine and ocean experiences through the use of oral history interviews, videos, tapes, photographs of manuscript documents, and models or replicas of artifacts. The awarding of academic credit for teachers' professional development, or for the completion of graduate-student projects, serve as examples of motivating criteria for the workshop.
- A. Long-Term:
- Package learning materials for teachers to use at all levels (pre-K, K-12, undergraduate, graduate, and community)
  - Disseminate learning materials to a wider community, including schools, and media organizations for publicity on television, radio, and in newspapers conferences, and marine forums
  - Seek grants to fund teachers' workshops
  - Present workshops for other COSEE programs, science conferences, and marine forums
  - Form collaborations with historical societies, cultural organizations, preservation societies, private collectors with individual collections for visits with students, and documentary repositories of marine history
  - Publish articles in magazines, journals of marine and environmental sciences, historical brochures, and videos
  - Network with state education professionals and curriculum specialists at district education levels to institutionalize this program and disseminate materials across the three states to a broader teacher community
  - Develop materials for parents that educate them about the opportunities and importance of water safety and the benefits of marine/ocean science education; identify career and employment opportunities; show involvement with faith-based organizations; include in-service and pre-service involvement of teacher preparation; and relate land environmental activities to the impact on ocean health.

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## Section 8. Concluding Recommendations—Where Do We Go From Here?

The last task of the charrette was to identify the themes, common threads, and actions that were repeated in the work of the three groups. The following items highlight those common themes as identified by Vivian Williamson and Albert George:

- Need to assess and evaluate activities, processes, results and extensions or modifications
- Maintain COSEE SouthEast's database of information, and acknowledge that it will take time to amass material for the database
- Need for technical and human resource assistance for compiling information, formatting

data, and maintaining/updating information for COSEE SouthEast's database and Web site. Consider graduate assistance from MS or PHD candidates.

- Develop survey instrument that addresses the key data needs identified in each group, rather than having three separate surveys that might be sent to the same groups
- Produce one strategic plan of action based on the task lists of the three groups
- Identify partnerships to build or promote COSEE SouthEast
- Expand goals and objectives of partners and COSEE SouthEast
- Encourage collaboration among HBCUs of N.C., S.C., and GA
- Leverage resources of COSEE SouthEast and other educational institutions
- Identify similar and existing barriers and roadblocks to marine science and science careers, although history and culture is a vehicle for breaking down barriers
- UCOSEE SE SouthEast as a model for other regions
- Establish a virtual community
- Evaluate component for each group's task
- Comply with the COSEE mandate and our NSF funding trust
- Identify vested interest from charrette participants in handling tasks identified during the charrette by identifying point persons, providing personal contacts, and serving as advocates for the process

Based on the work of charrette participants, two primary products or "deliverables" will result from our efforts: (1) the inventory and other task items for COSEE SouthEast developed from task groups that reach out to underrepresented groups to effectively engage their participation; and (2) the publication of proceedings from the charrette, which this report documents.

In addition to the list of action items developed from the charrette, many of us will engage in other efforts of COSEE SouthEast including:

- Collaboration with researchers and educators
- Professional development opportunities
- Supplementary school and summer opportunities
- Creation of COSEE SouthEast's multicultural poster
- Combining COSEE with the NOAA Expanding Your Horizons Conference that is presented every two years
- Mini-Camp Models
- Consideration of a funding host for a new scholarship
- Implementing COSEE SouthEast's Three-Year Plan for Coastal Heritage Celebration Programs, which include (1) Coastal Legacy Professional Development Program in Year One; (2) Indigenous Fishing Culture, Crafts, and Coastal Communities in Year Two; and (3) Importance of Ports and Harbors and Related Economic Impact in Year Three.

COSEE SouthEast's Coastal Legacy Professional Development Program is scheduled for July 12-17, 2004 in coastal heritage sites throughout the Lowcountry of South Carolina and Georgia. With the College of Charleston's Avery Research Center, the South Carolina Sea Grant Consortium, Caw Caw Interpretative Center and County Park, the Penn Center, and many other partners, COSEE SouthEast will host this week-long summer workshop to increase awareness and appreciation for the coast and coastal waters and culture for elementary and middle school teachers. The desired outcome of the workshop is that it will increase awareness of careers in marine science and coastal management by students, educators and researchers. The July workshop will focus on the rice culture and development of the Gullah/Geechee culture in coastal South Carolina and Georgia, and will be facilitated by Lemuel Patterson, Science Specialist with the South Carolina Department of Education.

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## Section 9: Epilogue –“The Charrette was a Success!”

The charrette was a success!

The charrette ended three days of storytelling, and matching COSEE SouthEast’s goals and objectives with specific tasks that could be accomplished within a specific timeframe for meeting those goals and objectives. A brief evaluation survey, using the rubric of 5 being high and 1 low, suggested that the participants (1) understood the purpose of the charrette, (2) felt engaged in the process, (3) felt there were tangible outcomes, and (4) were contributors and personally benefited (Appendix 5).

We were expertly guided by Vivian Williamson, who was adept at presenting common themes of our work and facilitating our deliberations in a focused way. We formed close friendships, laughed, cried, ate good food, talked about tough issues, and worked hard to create a plan of action for COSEE SouthEast. This plan is intended to uCOSEE SE SouthEast’s human and fiscal resources to develop relationships with the people, programs, institutions and organizations, as well as to access and create the kinds of resources needed to reach underrepresented populations, namely African American educators and students, in the ocean, atmospheric and environmental science professions.

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## Bibliography and Selected Resources

### Topical Sections

- a. Ocean Sciences and Diversity articles
- b. Ocean Sciences and Diversity websites
- c. Ocean Sciences Career, Internship, and Fellowship Opportunities
- d. Geosciences and Ocean Sciences Associations and Organizations websites
- e. Best Practices in Diversity Education Resources
- f. African American and Gullah Cultural Resources

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2003 AGI Fall Semester Internship in Geoscience Education and Outreach  
<http://www.agiweb.org/education/fallinternship.html>

2003 AGI Spring or Summer Semester Internship in Geoscience Education and Outreach  
<http://www.agiweb.org/education/summerinternship.html>

American Meteorological Association Scholarships & Fellowships <http://www.ametsoc.org/ams/>

ASLO Minorities <http://www.hamptonu.edu/science/ASLO.htm>

Careers in Oceanography <http://www.palomar.edu/oceanography/links/Careers.html>

The David and Lucile Packard Foundation Scholars Programs <http://www.packard.org/index.cgi>

Department of Energy's (DOE) Office of Biological and Environmental Research Global Change Education Program <http://www.atmos.anl.gov/GCEP/>

Earth Science World <http://www.earthscienceworld.org/careers/links/index.html>

Environmental Protection Agency (EPA) Science To Achieve Results (STAR) Graduate Fellowships <http://es.epa.gov/ncer/fellow/>

Fannie and John Hertz Foundation Graduate Fellowships <http://www.hertzfdn.org/index.html>

Geological Society of America Graduate Research Grants  
<http://www.geosociety.org/profdev/grants/gradgrants.htm>

INROADS Pre-College, Undergraduate and Post-Undergraduate Minority Education & Training Program <http://www.inroads.org/>

Minorities in Aquatic Sciences (MAS) Program <http://www.aslo.org/mas/>

MAST <http://www.hamptonu.edu/science/masthomepage.htm>

NASA's Education Program, Materials, and Services  
<http://spacelink.nasa.gov/Educational.Services/How.to.Access.Information/>

National Defense Science & Engineering Graduate Fellowships <http://www.asee.org/ndseg/>



National Oceanic & Atmospheric Association (NOAA)/National Estuarine Research Reserve Fellowships <http://www.ocrm.nos.noaa.gov/nerr/fellow.html>

NOAA Coastal Services Center Coastal Management Fellowships  
<http://www.csc.noaa.gov/cms/fellows.html>

National Physical Science Consortium Graduate Fellowships <http://www.npsc.org/>

Ocean Drilling Program Graduate Fellowships  
<http://www.joi-odp.org/USSSP/Fellowship/Fellowship.html>

United Negro College Fund <http://www.uncf.org/>

University Corporation for Atmospheric Research Student & Postgraduate Opportunities  
<http://www.ucar.edu/opportunities/opps-students.html>

Women Oceanographers <http://www.womenoceanographers.org/>

**d. Geosciences and Ocean Sciences Association and Organizational Websites**



American Geological Institute <http://www.agiweb.org/>



American Geophysical Union <http://www.agu.org>



American Institute of Physics <http://www.aip.org>



American Meteorological Society <http://www.ametsoc.org/AMS/>



American Society of Limnology and Oceanography [www.aslo.org](http://www.aslo.org)



Association for Women Geoscientists <http://www.awg.org/>



Consortium for Oceanographic Research and Education

[www.coreocean.org](http://www.coreocean.org)

Department of Energy, Fossil Energy Program <http://www.fe.doe.gov/>



Digital Library for Earth System Education [www.dlese.org](http://www.dlese.org)



EPA Environmental Protection Agency <http://www.epa.gov/>



Geological Society of America <http://www.geosociety.org>

Guide to Geoscience Departments in the United States and Canada Online  
<http://www.agiweb.org/her/ggd/>



JGOFS Joint Global Ocean Flux Study

<http://www.uib.no/jgofs/jgofs.html>



Joint Oceanographic Institutions <http://www.joi-odp.org/>

Minerals Management Service <http://www.mms.gov/>

Minority Participation in the Earth Sciences (MPES) Program  
<http://wwwflag.wr.usgs.gov/USGSFlag/Overview/Admin/mpes.html>



NASA <http://www.nasa.gov/>



Science at NASA <http://science.msfc.nasa.gov/EarthScience.htm>



NOAA National Oceanic and Atmospheric Association <http://www.noaa.gov/>

NOAA –National Geophysical Data Center, Boulder, Colorado  
<http://www.ngdc.noaa.gov/ngdc.html>



National Science Foundation <http://www.nsf.gov/>



The Oceanographic Society <http://www.tos.org/>

Society of Exploration Geophysicists <http://www.seg.org>



The Society for Mining, Metallurgy, and Exploration, Inc.

The Society for Mining, Metallurgy and Exploration <http://www.smenet.org/>



Soil Science Society of America <http://www.soils.org/>



U.S Geological Survey <http://info.er.usgs.gov/>



The Weather Channel <http://www.weather.com/>

#### **e. Best Practices in Diversity Education**

Engagement, Capacity and Continuity: A Trilogy for Student Success Full Report <<http://www.campbell-kibler.com/trilogy.pdf>> ; and An Overview <[http://www.campbell-kibler.com/trilogy\\_summary.pdf](http://www.campbell-kibler.com/trilogy_summary.pdf)> ; Eric J. Jolly, Patricia B. Campbell and Lesley K. Perlman. A Report Commissioned by the GE Foundation. 2004. (.pdf) <http://www.campbell-kibler.com/>

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**African American and Gullah/Geechee Culture Websites**

Amistad Research Center [www.amistadresearchcenter.org](http://www.amistadresearchcenter.org)

Avery Research Center [www.cofc.edu/avery](http://www.cofc.edu/avery)

Caw Caw Interpretive Center [www.ccprc.com/cawcaw.htm](http://www.ccprc.com/cawcaw.htm)

Gullah/Geechee Sea Island Coalition <http://users.aol.com/queenmut/GullGeeCo.html>

Penn Center, Inc. [www.penncenter.com](http://www.penncenter.com)

***We would like to continue to update this bibliography. If you have recommendations, please email them to Lundie Spence, COSEE SouthEast Director ([Lundie.spence@scseagrant.org](mailto:Lundie.spence@scseagrant.org)).***

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## Appendix 1: Charrette Agenda

### Multicultural Pathways to Ocean Science Education

Date: May 21-23, 2003

Location: Avery Research Center for African American History and Culture,  
College of Charleston, 125 Bull Street, Charleston, SC

Contact: (843) 953-7609 – [www.cofc.edu/avery](http://www.cofc.edu/avery)

Participant Lodging: Hampton Inn, Charleston, SC

#### **Wednesday, May 21, 2003**

10:00 – 11:00 a.m. – 2nd Floor – Historic Avery Classroom

Welcomes--

Lundie Spence, Ph.D. , Director, SouthEast COSEE

Rick DeVoe, Executive Director, South Carolina Sea Grant Consortium

Karen Chandler, Ph.D., Director, Avery Research Center

Group Introductions Orientation and Tour of Avery

11:00–12:00 noon – 1st Floor Seminar Room

Presentation of Charrette Goals

Introduction of Vivian Williamson, Ph.D., Facilitator

Processing the Big Picture of African American in the ocean sciences

Noon–1:00 p.m. – Lunch: 3rd Floor McKinley Washington Auditorium

1:00–3:00 p.m. – 1st Floor Seminar Room

Where Are We Going? What are the expectations for the ocean sciences and education communities? Precollege, undergraduate, graduate and career tracks.

Where Have We Been? Building On Prior Efforts

3:00-5:00 p.m. – Reporting and Synthesis

Dinner on your own in Charleston

#### **Thursday, May 22, 2003**

9:00–11:00 a.m. – 1st Floor Seminar Room

Testimonials: Telling your story -- what enabled you to make it?

11:00–12:00 – What did we learn?

Common threads which created and sustained interest in ocean sciences

Noon–1:00 p.m. – Lunch

1:00–3:00 p.m. – Facilitate set of ideas and programs successful

3:00–6:00 p.m. – Experiencing oceanography on the NOAA R/V Nancy Foster  
Thanks to Leslie Sautter, Ph.D., geologist, College of Charleston and  
Rachel McEvers, College of Charleston River

6:00–8:00 p.m. – Gullah Dinner at the Avery Center

**Friday, May 23, 2003**

9:00–11:00 a.m. – Building a Plan for SouthEast COSEE -Vivian Williamson

Noon–1:00 p.m. – Lunch in 3rd Floor Auditorium

1:00–3:00 p.m. – Identifying Partners and Seeking Engagement,

New or continuing efforts and funding; outcomes in 3-4 years; expectations

Wrap-up and Manuscript Expectations

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## Appendix 2: Charrette Participants

*(addresses reflect positions at the time of the charrette)*

**Sue T. Bowden, Ph.D.**

Associate Professor, Biology  
University of North Carolina, Pembroke  
Lumberton, NC  
(retired)

**Sheila A. Brown, Ph.D.**

Center for Ocean Sciences Education Excellence  
J.L. Scott Marine Education Center & Aquarium  
Ocean Springs, MS

**Karen A. Chandler, Ph.D.**

Director, Avery Research Center for African American History and Culture  
College of Charleston  
Charleston, SC  
(Associate Professor, Arts Management, College of Charleston)

**Jennifer Jolly Clair**

COASTeam Program Manager  
SouthEast COSEE Curriculum Specialist  
Lowcountry Hall of Science and Math  
College of Charleston  
Charleston, SC  
(Porter Gaud School, Charleston, SC)

**Sue Cook, Ph.D.**

Ocean Sciences Division  
National Science Foundation  
Arlington, VA  
(Consortium for Ocean Research and Education, Washington, DC)

**Willie Frazier**

Education Consultant  
South Carolina Department of Education  
Columbia, SC

**Albert A. George II**

Booz/Allen/Hamilton  
McLean, VA

**Joyce Hilliard-Clark, Ph.D.**

Coordinator of the Imhotep Academy  
The Science House, NCSU  
Raleigh, NC

**Dionne Hoskins, Ph.D.**

Fishery Biologist DOC/NMFS/NOAA  
Assistant Research Professor  
Savannah State University  
Savannah, GA

**Paula Keener-Chavis**

National Education Coordinator  
NOAA Office of Ocean Exploration  
Charleston, SC

**Ashanti J. Pyrtle, Ph.D.**

Georgia Institute of Technology  
Atlanta, GA  
(now with University of South Florida, St. Petersburg, FL)

**Jeffrey O. Roberts**

Closing the Achievement Gap  
NC DPI  
Raleigh, NC

**Andy Shepard**

NOAA/National Undersea Research Center  
UNC-Wilmington  
Wilmington, NC

**Lundie Spence, Ph.D.**

Director, SouthEast COSEE  
South Carolina Sea Grant Consortium  
Charleston, SC

**Carrie Thomas, Ph.D.**

Marine Earth and Atmospheric Sciences  
NCSU  
Raleigh, NC

**Brenda Chee Wah**

Research Associate  
Earth System Science Program  
Clark Atlanta University  
Atlanta, GA

**Vivian Williamson, Ph.D. – Facilitator**

Houston, TX



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## Appendix 3 Host Institutions and Overviews

### Center for Ocean Sciences Education Excellence SouthEast

Modified from Web site: [www.scseagrant.org/se-cosee](http://www.scseagrant.org/se-cosee)

COSEE SouthEast is one of seven regional centers awarded by the National Science Foundation. COSEE SouthEast received a three year award from 2002-2005. Additional support comes from NOAA/Coastal Services Center and NOAA/Office of Ocean Exploration. COSEE SouthEast is administered by the South Carolina Sea Grant Consortium. COSEE SouthEast includes science and education partners in Georgia, South Carolina and North Carolina.

The primary objectives of COSEE SouthEast are to:

- facilitate integration of research into educational materials and programs, and establish linkages that will foster their development and dissemination;
- create new professional development opportunities;
- provide incentives and assistance for school districts and teachers to integrate standards-based ocean sciences resources into curricula;
- ensure that underrepresented groups have improved access to ocean science education;
- foster the effective use of information technology; and
- provide expertise in evaluation, and design evaluation instruments.

COSEE SouthEast's approach to realizing these objectives include developing a systemic infrastructure of development and exchange of ocean science education activities and ocean science research. Key elements of this strategy include the administrative assistance of Georgia Sea Grant, South Carolina Sea Grant Consortium and North Carolina Sea Grant, a Board of Advisors, and development of partnerships with universities, agencies and organizations.

COSEE SouthEast invites partnerships to create new opportunities for developing discovery-based ocean education activities, strongly connected to the southeast region and to regional ocean science research efforts.

### South Carolina Sea Grant Consortium

Modified from Web site: [www.scseagrant.org](http://www.scseagrant.org)

The South Carolina Sea Grant Consortium is a university-based network supporting research, education, and outreach to conserve coastal resources and enhance economic opportunity for the people of South Carolina.

The network of higher education institutions include South Carolina State University, Clemson University, the Medical University of South Carolina, The Citadel, Coastal Carolina University, University of South Carolina, College of Charleston, and includes the South Carolina Department of Natural Resources. Consortium institutions provide the expertise of their respective faculty and professional staffs, as well as a wide range of facilities and equipment, necessary to carry out the diversity of programs supported by the S.C. Sea Grant program.

Recognizing the needs and opportunities embodied by the state's vast array of ocean and coastal resources, the S.C. General Assembly formally united the state's various marine programs through the creation of the S.C. Sea Grant Consortium in 1978 (Code of South Carolina, Section 48-4510:100). This legislative mandate sets out three main tenets upon which the Consortium operates:

"To provide a mechanism for the development and management of the Sea Grant Program for the State of South Carolina and adjacent regions that share a common environment and resource heritage."

"To support, improve and share research, education, training and advisory services in fields related to ocean and coastal resources."

"To encourage and follow a regional approach to solving problems or meeting needs relating to ocean and coastal resources in cooperation with appropriate institutions, programs, and persons in the region."

The S.C. Sea Grant Consortium is committed to maximizing the economic, social, and environmental potential of the state's coastal and marine resources. The Consortium has identified three concepts that provide the foundation for its future activities:

1. To develop and maintain an integrated research, education, and extension program for South Carolina that seeks to provide for future economic opportunities, improve the social well being of its citizens, and ensure the wise use and development of its marine and coastal natural resources.
2. To continue to build an effective and efficient communications and marine extension network among academia, business, government and the general public to ensure that Consortium activities are responsive to marine and coastal users and that information generated is delivered in a timely fashion.
3. To remain an integral component of the National Sea Grant College Program and other organizations where Consortium activities are responsive to regional and national needs, as well as to those of South.

### Avery Research Center for African American History and Culture, College of Charleston

modified from web site: <http://www.cofc.edu/avery/>

The Avery Research Center at the College of Charleston is an archives, research entity and museum. Its mission is to collect, preserve, and document the history and culture of African Americans in South Carolina and the Lowcountry region, an area of the southeast coast referred to as the Gullah-Geechee region which includes the Sea Islands of South Carolina and Georgia, and reaches the northern coastal area of Florida. It is this region from which roughly half of all African Americans in the United States can trace their arrival to this continent as enslaved people.

The Center maintains a collection of primary and secondary documentary material dating from the late 18th century that encourages scholarship, research, and presentations by scholars, researchers, and students. The Center also operates as a museum with several gallery spaces, and as a national historic site with a listing on the National Register of Historic Sites.

The manuscripts, documents, and resources collected by the Center serve as the primary source materials for the writing of African-American history. For too long, the history of African Americans in the United States has been ignored, distorted, neglected, and omitted from the standard American history text books. The Center provides scholars, researchers, and students primary sources, documents, and manuscripts to document and write accurately the history of African American in South Carolina.

The Center's mission extends beyond collecting and preserving documents. From its beginnings in 1985, the Center has sponsored conferences, lectures, exhibits, archival workshops, films, and educational programs in an effort to inform the community about the history and culture of South Carolina's African Americans. The Center's public programs have enabled it to convey to the public the importance of collecting and preserving historical records and documents.

Avery's story and the rich tradition of African American culture of the South Carolina Lowcountry and regional sea islands, is preserved and told, annually, to over 3,500 patrons through the Center's archives, and over 4,500 tourists and visitors through the Center's interpretive tours and museum.

### Savannah State University

Modified from website: <http://www.savstate.edu/>

Savannah State University's (SSU) Department of Biological Sciences offers Bachelor of Sciences degrees in Biological and Life Sciences, Marine Science, and Environmental Science, and a Master of Science in Marine Science.

The department has prepared thousands of students for careers in medicine and the life sciences. The Drew-Griffith Biological Sciences building is expanding to accommodate even more laboratories for student and faculty research. Students pursuing a Bachelor of Science degree in Biology learn the latest in genetic engineering, bioremediation, physiology, and toxicology.

The Marine Science program began in 1979. After more than two decades of growth, it is the state's only on-campus marine biology facility located on a saltwater marsh. The program's facilities include a 6,000-square-foot building with a wet-laboratory, two environmental chambers, dry-laboratory, classroom, resource center/computer room, locker rooms, offices, and lobby with display aquaria, preserved collections of marine invertebrates, fishes and algae, and analytical equipment; a dock with a 60-foot floating section for college work boats and pump for the wet-laboratory sea water supply; a 35-foot twin-diesel work boat, a 22-foot outboard work boat, and a 50-hp pontoon boat; and a 15 passenger van.

SSU started its Master of Science in Marine Science degree program in the fall of 2002. The mission of the program is:

- to develop strong graduate and research programs in line with the unique coastal and urban setting and based on excellence in undergraduate programs
- to develop strong educational programs and serve students from diverse educational, geographical, and racial backgrounds
- to make a commitment to outreach and community participation in regional issues

The Marine Science program offers three curriculum tracks in traditional marine science research, applied marine sciences, and professional advancement. The program has formal and funded collaborative partnerships with the Skidaway Institute of Oceanography; the National Oceanic and Atmospheric Administration (DOC/NOAA/NMFS); the University of Virgin Islands; Harbor Branch Oceanographic Institution; the Waddell Mariculture Research and Development Center; University of Georgia Marine Education Center and Aquarium; and The Living Marine Research Cooperative Science Center (LMRCSC) in cooperation with the University of Maryland Eastern Shore, Hampton University, Delaware State University, University of Miami (FL) and NOAA Northeast and Southeast Fisheries Science Centers.

SSU's Marine Science Program published a CD-Rom in 2000 titled "Bridging the Gap: Minorities in Marine Science."

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## Appendix 4: Selected Programs to increase ocean science diversity

The following selected programs provide models designed to enhance access of underrepresented students to marine and ocean sciences:

- Minorities in Marine Science Undergraduate Program (MIMSUP) at the Shannon Point Marine Center
- Native Americans in Marine and Space Sciences (NAMSS) Program and the Diversity Internship Program (DIP) at Oregon State University
- Minority Mentorship in Science Seminar (MMISS) Series at Savannah State University
- NOAA/Entrepreneur Partnership Program. .
- ASLO program
- The Living Marine Resources Cooperative Science Center (LMRCSC) – a collaborative program between the National Oceanic and Atmospheric Administration; The University of Maryland, Eastern Shore; The University of Maryland Center for Marine Biotechnology; The University of Miami; Delaware State University; Hampton University, and Savannah State University
- Minorities At Sea Together (MAST) – Hampton University
- Collaboration to Integrate Research and Education (CIRE) Program with the Skidaway Institute of Oceanography (SkIO) at Savannah State University
- Hall-Bonner Program for Minority Doctoral Scholars in Ocean Sciences with Hampton University, Old Dominion University, and The College of William and Mary, Virginia Institute of Marine Science
- MIMES -- South Carolina Minorities in Marine and Environmental Sciences Summer Intern Program at South Carolina Department of Natural Resources, Marine Resources Division, Charleston, SC
- Bridge to the Doctorate Program at USF supported by NSF
- Florida-Georgia Louis Stokes Alliance for Minority Participation
- American Geological Institute (AGI) Minority Geoscience Scholarships
- NC A&T NSF Opportunities for Enhancing Diversity Geophysical Field Research and Training Program. (Caesar Jackson, PI)



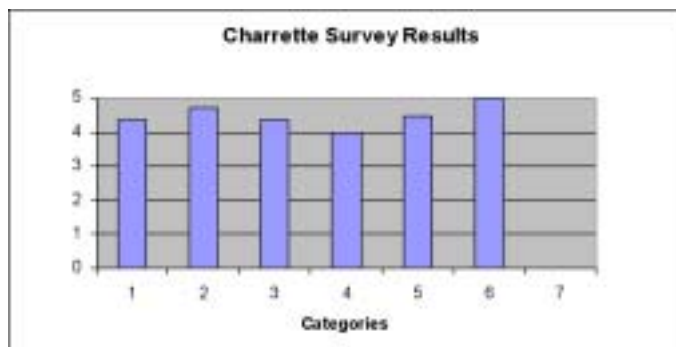
## Appendix 5. Evaluation Results from Survey of Participants

### 1. Exit Survey: Multicultural Pathways to Ocean Sciences Education

*Use the rubric of 5 being high and 1 low for the following questions. Your comments could be suggestions for improvement or additional thoughts.*

1. To what degree did you understand the purpose of the charrette in regard to SE COSEE? Comment
2. To what degree did you feel engaged in this process through the facilitation? Comment
3. To what degree did you feel the results of the three days resulted in a tangible outcome for SE COSEE? Comment
4. To what degree did you feel that you contributed to the process? Comment
5. To what degree did you benefit from attending? Comment
6. To what degree did you feel the Avery Center met the needs for a charrette?
7. Please make any comments or ideas which you did not get to make during the process?

### 2. Exit Survey Results:



Comments excerpted from the Evaluation forms from the seven questions.

1. purpose was clear; unaware of a Charrette format
2. thoroughly engaged; highly motivated
3. funding will be limiting factor; words cannot describe the work done; constructive framework
4. wish there were more
5. great networking; enriching; empowering
6. awesome setting, wonderful location
7. use laptop to facilitate time in sessions