IMPLEMENTATION PLAN

Award Number NA16SEC481009

Lead Institution-Florida A&M University-Dr. Larry Robinson

School of the Environment, 1515 Martin Luther King Blvd., Tallahassee, FL 32307

Center for Coastal and Marine Ecosystems (NOAA CCME)

Partner Institutions

Bethune-Cookman University- Dr. Hyun Jung-Cho

California State University Monterey Bay-Dr. Corey Garza

Jackson State University-Dr. Timothy Turner

Texas A&M University-Corpus Christi-Dr. Richard McLaughlin

University of Texas Rio Grande Valley-Dr. David Hicks

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This revision: September 2019

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The NOAA CCME Plan herein has undergone revisions in response to recommendations of NOAA EPP/MSI and the NOAA CCME Technical Monitors following the initial 2016 submission of the plan. An Addendum (Appendix VI) was made following revisions in 2018. For this final submission revisions have also been made in response to changes in funding and NOAA CCME's success in filling all key personnel positions, including the addition of the Administrative Coordinator position to provide support across the Center. This position is funded by Florida A&M University in support of the award functions.

What is New

Recent revisions to the enclosed plan include the following.

- Table 2 map of the alignment of specific NOAA CCME activities to the expected award outputs and outcomes as specified in the FFO (Award agreement #NA16SEC4810009). (Page 6)

- The addition of key personnel as demonstrated in the NOAA CCME Management Organization Chart. (Figure 2, Page 13)

- Details of the rising sophomore summer experience activities to prepare students to successfully compete for NOAA Undergraduate Scholarship opportunities and other fellowships. (Page 21)

- The list of Student Competencies (Appendix VII, Page 57) as outlined in the NOAA CCME Evaluation Plan that align student training with NOAA's Education Strategic Plan workforce goals.

I. Executive Summary

The National Oceanic and Atmospheric Administration's (NOAA) Environmental Cooperative Science Center (ECSC) has served NOAA and the nation for fifteen years, stemming from a series of competitively awarded cooperative agreements in 2001, 2006 and 2011. The NOAA ECSC was a cooperative agreement between the NOAA Educational Partnership Program for Minority Serving Institutions (NOAA EPP-MSI) Cooperative science center awards are administered through an agreement with the lead institutions. Florida A & M University (FAMU), the lead institution, and academic partner institutions Texas A&M University-Corpus Christi (TAMU-CC), Jackson State University (JSU), Delaware State University (DSU), Creighton University (CU), and the University of Texas-Rio Grande Valley (UTRGV, formerly University of Texas - Brownsville). During the most recent award period of the NOAA ECSC a total of 110 students graduated through the ECSC program (2011-2018). Funding garnered through these awards, the establishment of a strong network of partnerships with NOAA and state agencies, and major investments by ECSC academic institutions have led to unprecedented success in the production of scientists, in particular from underrepresented minority groups, in the science and policy of environmental, coastal, and marine ecosystems (Robinson *et al*., 2007).

Examples of ECSC alumni include Dr. Latoya Myles, Deputy Director of the Air Resources Laboratory Atmospheric Turbulence and Diffusion Division, NOAA OAR, Dr. Natasha White, a Program Management Specialist for the NOAA EPP/MSI and Dr. Trika Gerard, Branch Chief, Science Planning and Coordination Branch, NOAA Southeast Fisheries Science Center. Recent ECSC graduates Maria Cooksey, Shareena Cannonier and Tyler Hansberry have gone on to employment at the Florida Fish and Wildlife Research Institute, EPA, and AGEISS Inc. respectively. Former ECSC graduates have also continued in the graduate student pipeline including Andrea Pugh who has recently entered a PhD program as a NOAA CCME Graduate Scholar.

Significant advances in the scientific understanding of fundamental coastal and marine ecosystem processes and the coupling of human and ecosystem interactions in coastal environments have also been achieved through collaborative activities of Center faculty, staff and students, and NOAA scientists. One major effort of the Center was the incorporation of integrated assessments, currently available to NOAA NOS National Estuarine Research Reserve sites and other interested stakeholders, which improved the understanding of the response of coastal ecosystems, including human activities and natural stressors, and contributed to the development of tools to characterize, evaluate, and forecast critical attributes of ecosystem health. In addition, ECSC facilitated informal education and outreach activities designed to increase knowledge and awareness of the

function and significance of coastal ecosystems by citizens and decision makers. As a result of the funding opportunity, many "Best Practices" were identified and implemented.

The NOAA Center for Coastal and Marine Ecosystems (NOAA CCME), a NOAA EPP/MSI cooperative agreement with Florida A&M University as the lead institution, builds upon these best practices to ensure even greater outcomes during the implementation of the current award. NOAA CCME has adopted a mission to educate and train a new generation of scientists, particularly from underrepresented minority communities, in NOAA-relevant STEM disciplines and social sciences. NOAA CCME supported students are trained to utilize interdisciplinary approaches to address issues confronting marine and coastal communities. Through NOAA-relevant research, the NOAA CCME faculty, staff and students will produce results that can be used for better understanding and resolution of short-term and long-term science and policy issues related to coastal regions. The outreach activities of the Center are designed to increase community stakeholder knowledge and awareness of science and policy issues and to influence future NOAA CCME education and research priorities.

Graduates will be well versed in NOAA-related sciences and the new U.S. framework for coastal planning in response to vulnerabilities due to climate change and increasing human population and anthropogenic impacts through course work, research, and the NOAA Experiential Research and Training Opportunity (NERTO) internships.

The NOAA CCME approach aligned with the award solicitation includes:

a) Establishment of a NOAA-mission future workforce pipeline through interdisciplinary education, training and research at the undergraduate, graduate and postdoctoral levels;

b) Strategic site selection of coastal and estuarine ecosystems, utilization of the sites selected will provide a platform for implementing place-based research, education and outreach as shown in Figure 1.; and

c) Development and application of ecological and socioeconomic sciences and policy/decision making tools in support of NOAA's goals for coastal resilience.

The Center Director (CD) is responsible for the overall management of NOAA CCME with day to day activities completed with the assistance of the Associate Director, Assistant Director, Education Expert and Distinguished Research Scientist who, along with the Institutional PIs and Focal Area Leads, make up the Center Management Team (CMT).

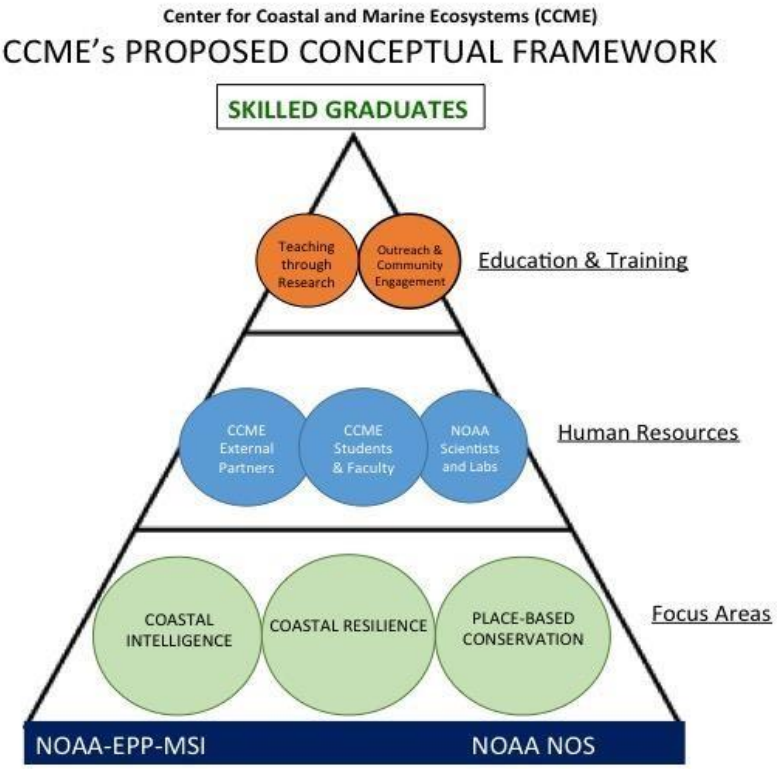


Figure 1. *Conceptual Framework of NOAA CCME.*

Conceptual Framework

The Conceptual Framework utilizes resources and scientists/mentors from both NOAA and NOAA CCME to achieve the unique skill sets required of all graduates. This collaboration enables students to meet required competency levels through coursework and by conducting research in their home institutions and NOAA facilities, and obtain additional experiential training by participating in NOAA Experiential Research and Training Opportunities (NERTOs) as well as other NOAA opportunities (eg. Okeanos, Nautilus). The infusion of both human resources and exceptional training opportunities by NOAA results in the production of highly skilled graduates. Additional training opportunities are provided through student development activities such as conferences, workshops, and webinars. Special emphasis will be given to rising sophomores to prepare them to apply for opportunities in NOAA particularly the Hollings and EPP Undergraduate Scholarships programs, as well as other opportunities. A special webinar series will be used to train these student cohorts and facilitated by the partner institution PIs and education specialists. The Center Management Team (CMT) will collaborate with institutional PIs to create a NOAA CCME brand that provides a sense of belonging and pride in the Center. In particular, the CMT will develop a series of NOAA CCME webinars that will be required for all student cohorts that will communicate of expectations and implement the Letter of Understanding (LOU), which will be signed by all students supported by NOAA CCME. In addition, the Communication Manager along with Education Expert will facilitate a

Facebook/Twitter account for NOAA CCME students available for student cohorts to exchange information and dialogue across the Center.
Finally, an External Evaluator will provide the CMT with data and information that will be used for formative and summative results that will guide the mid and long-term correction towards continuous improvement in the student cohort training activities. Based upon the mission and conceptual frame for the NOAA CCME, the following goals and objectives have been established:

1) Recruit, train, and graduate students, particularly from underrepresented minority groups, with the competencies and skills that support NOAA's Education Strategic Plan, workforce goals and strategic objectives:
    a. Provide financial support, education and training experiences for undergraduate students, graduate students, and postdoctoral fellows through teaching and mentoring provided by NOAA CCME faculty.
    b. Leverage new and existing partnerships with community colleges and to recruit and prepare students for NOAA-relevant degree programs at NOAA CCME institutions.
    c. Utilize the Center-Wide Core Competency (CWCC) course to ensure student proficiency in NOAA CCME focal areas.
    d. Expose students to broader research and experiential learning opportunities such as Student Scholarship Internship Opportunities (SSIO) and NERTO, as well as through partnerships with NOAA and other scientists.
2) Conduct research leading to the development of management and communication tools that can be utilized to enhance the resilience of coastal communities and economies:
    a. Assess coastal risks and vulnerabilities
    b. Identify solutions to reduce risks and vulnerability
    c. Utilize engagement to empower coastal communities.
3) Develop competency and skills in the utilization of new and existing "Big Data" archives in decision support tools that promotes the vibrancy of coastal and marine ecosystems.
    a. Develop and implement a "Big Data Analytics Boot Camp".
    b. Conduct research utilizing "Big Data" sets related to coastal and marine ecosystems.
    c. Develop tools such as communication and mitigation strategies associated with threats to coastal and marine ecosystems and coastal communities.

The goals of NOAA CCME align with strategic priorities identified by the U.S. Department of Commerce (DOC), NOAA, and the NOAA Educational Partnership Program with Minority Serving Institutions (EPP/MSI), NOAA Oceanic and Atmospheric Research (OAR), and the National Ocean Service (NOS) roadmap (See Table 1).

Table 1 Alignment of NOAA CCME Goals with NOAA/DOC/NOS

Department of Commerce Strategic Plan 2014- 2018	NOAA's Next Generation Strategic Plan 2010	NOS Roadmap 2014	NOAA Education Strategic Plan 2015-2035	NOAA CCME Goals
3.1. Advance the understanding and prediction of changes in the environment (NIST, NOAA) 3.3. Strengthen the resiliency of communities and regions (EDA, ESA, NIST, NOAA) 3.4. Foster healthy and sustainable marine resources, habitats, and ecosystems (NOAA) 3.5. Enable U.S. businesses to adapt and prosper by developing environmental and climate informed solutions (ESA, ITA, NIST, NOAA)	Climate Adaptation and Mitigation Resilient Coastal Communities and Economies	Coastal Resilience: preparedness, response, and recovery Coastal Intelligence Place-based Conservation	Science Informed society Conservation and stewardship Safety and Preparedness (individuals and communities are informed and actively involved in decisions and actions) Future workforce (a diverse and highly skilled future workforce)	1) Recruit, train, and graduate underrepresented minority groups, with working technical skills, knowledge and competencies 2) Develop and implement communication vehicles, training tools, and opportunities that enhance the resilience of coastal communities and economies; 3) Develop competency and skills in utilizing new and existing large data in decision support data tools that promotes coastal and marine ecosystems vibrancy which address: climate change, coastal and marine conservation, and vulnerabilities

II. Introduction

Purpose of the Implementation Plan:

The Center for Coastal and Marine Ecosystems (NOAA CCME) is led by Florida A&M University (FAMU) in partnership with Bethune-Cookman University (B-CU), California State University Monterey Bay (CSUMB), Jackson State University (JSU), Texas A&M University-Corpus Christi (TAMU-CC), and the University of Texas at Rio Grande Valley (UTRGV). The institutions will present a suite of goals and objectives in alignment with NOAA's current priorities as reflected in the NOS Roadmap (NOS, 2014). All participating institutions are designated as Minority Serving Institutions (MSI), Hispanic Serving Institutions (HSI) or Historically Black Colleges and Universities (HBCU) by criteria established by the United States Department of Education (USDOEd). These academic partners provide NOAA with access to a diverse pool of minority students who are underrepresented in areas critical to NOAA's mission, an impressive array of academic programs with the established capacity to provide quality educational experiences to train students in NOAA-related sciences, and a collection of highly qualified faculty committed to

engaging in teaching, service, and research needed to support the desired outcomes of the NOAA CCME. The Implementation Plan will be used to guide the Post-Secondary Education and Training, the Scientific Research, and the management of the Administrative functions. This Implementation Plan will provide the operational framework for the NOAA CCME during the funding period.

Implementation Plan synopsis:
The Implementation Plan provides an outline of the overall and day-to-day operational plans during the performance period of the award. The plan describes the expected accomplishments and performance metrics for the three major functions (i) Administrative, (ii) Post-Secondary Education, and (iii) Scientific Research.

Products and Outcomes aligned with Program-level Outputs and Outcomes:

The NOAA CCME outputs and outcomes are aligned with EPP/MSI as shown in Table 2.

Table 2 Outcomes and Outputs

NOAA EPP/MSI and NOAA CCME Outputs/Outcomes*	**Process**
5.1 Education and Training	
Outcome 1. Increased number, annually, of CSC post-secondary students, trained. *Outputs* 1.1. Increased quantitative and analytical skills; 1.2. Increased competence in applying STEM to decision making, policy and management; 1.3. Increased skills to use large data sets, geographical information systems (GIS) and statistical analysis, computer modeling, and algorithm development.	1.1 - 1.3 Skill sets developed through CWCC course training online modules and in-person hands-on activities. Through CWCC training students are introduced to several methods of computer modeling, statistical analysis, GIS methods, Big Data uses and resources, decision-making, policy, and management. NOAA CCME faculty from all partner institutions contributed to the design and implementation of the CWCC training course.
Outcome 2. Increased number of CSC post-secondary students educated and graduated annually. *Outputs*	2.1 Individual Student Development Plans are utilized as a retention tool to identify areas of concern in the academic progress of each NOAA CCME Scholar at the end of each school term (quarter or semester). As the award activities progressed a midterm check-in was also implemented to identify any need for intervention to ensure student success.

NOAA EPP/MSI and NOAA CCME Outputs/Outcomes*	Process
2.1. The number of degrees earned annually in NOAA mission-related disciplines. 2.2. The number of students (total and URM) who participated in professional development opportunities, to include at least one on-site experiential research and training opportunity at a NOAA lab, office, or facility with tangible training and research: (a) for a minimum duration of 4 consecutive weeks, and (b) resulted in a publication or an oral or poster presentation to experts, peers, and/or other stakeholders.	2.2 NOAA CCME Graduate Scholars are required to participate in a 12 consecutive week NOAA Experiential Research and Training Opportunity. In addition, undergraduate and graduate students are encouraged to take advantage of other training opportunities offered by NOAA and other entities, including but not limited to Okeanos Explorer Training, Nautilus Explorer Training, and NOAA OR&R short courses. NOAA CCME Scholars present their internship experiences to the NOAA CCME Scholar group to foster center-wide community support and professional development. In addition to the NOAA EPP/MSI Biennial Education and Science Forum NOAA CCME Undergraduate and Graduate Scholars are encouraged to participate in several professional conferences including AGU, CERF, ASLO and SACNAS.
Outcome 3. Increased CSC capacity to train and graduate students. *Outputs* 3.1. Number of seminars, new courses, new programs, and new degrees offered to develop working skills and functional competencies to support the NOAA mission and workforce. 3.2. Total numbers of students supported by the CSCs and degrees awarded that reflect the changing demographics of the nation (Census Bureau 2014 National Projections, http://go.usa.gov/c2VfP).	3.1 In addition to OneNOAA Seminars, NOAA CCME conducts webinars featuring NOAA guest speakers as well as NOAA CCME Scholars to share NOAA-relevant research and professional development topics center-wide. Several seminars are also shared with non-CSC supported students at each partner institution. 3.2 All NOAA CCME Partner institutions are minority-serving institutions. All NOAA CCME partners identified and participated in campus efforts to recruit underrepresented populations using NOAA CCME recruitment materials (see Section V. of this Implementation Plan, Participant Recruitment and Support)
Outcome 4. Reduce the attainment gap for URMs in NOAA mission-relevant fields. *Outputs* 4.1. Increased number of URM students in student development activities that will lead them to the attainment of degrees and/or	4.1 – 4.2 All NOAA CCME Partner institutions are minority-serving institutions. All NOAA CCME partners identified and participated in campus efforts to recruit underrepresented populations using NOAA CCME recruitment materials (see Section V. of this Implementation Plan, Participant Recruitment and Support). Demographics may be determined through query of the NOAA CSC Student Tracker System.

NOAA EPP/MSI and NOAA CCME Outputs/Outcomes*	Process
employment in NOAA mission fields. 4.2. Increased number of URM students who select to pursue higher education in NOAA mission fields.	
5.2 Scientific Research	
Outcome 1. Increased NOAA mission-relevant research capacity at MSIs. *Outputs* 1.1. Number of research collaborations with NOAA and CSC faculty, staff and students. 1.2. Number of NOAA scientists serving as mentors and advisors for student research. 1.3. Number of intra-institutional collaborative partnerships established and maintained in support of NOAA's mission. 1.4. Number of uses of NOAA data in research and tool development. 1.5. Number of inter-institutional collaborative partnerships established and maintained in support of NOAA's mission.	1.1 Required NOAA CCME Graduate Scholar participation in NERTOs serves as an opportunity for collaborative manuscripts and research projects. NOAA CCME faculty, staff, and student engagement with NOAA personnel at CSC, NOAA CCME, and national professional conferences and workshops foster establishment of collaborations. NOAA CCME has hosted three annual meetings with strong NOAA participation at three separate NOAA facility locations. NOAA CCME will host the NOAA EPP/MSI 10th Biennial Education and Science Forum in 2020. NOAA CCME Distinguished Research Scientist (DRS) facilitates three-way discussions between NOAA CCME scholars, faculty advisors, and NOAA mentors to develop NERTO projects that align with NOAA priorities and the student/advisor academic research. The student/advisor/ mentors are encouraged to produce joint publications and explore possibilities for future collaborative research (proposals) as ideal outcomes of the NERTO. The DRS contacts new NOAA CCME Graduate Scholars and their advisors during the students' first semesters to try to identify NOAA mentors and collaborative research topics early, which increases the likelihood of the NERTO being relevant to the student's research and the NOAA mentor co-authoring papers as outcomes of the research. NOAA CCME partnering institutions participate in and host various meetings. These facilitate the development and continuation of collaborations with NOAA scientists 1.2 NOAA CCME DRS and faculty expand their network of colleagues working in their disciplines at NOAA through participation in national meetings, workshops and conferences, participation of NOAA personnel in the NOAA CCME Annual Meeting, and communication with the EPP office and NOAA CCME Technical Monitors. The diversity

NOAA EPP/MSI and NOAA CCME Outputs/Outcomes*	Process
	of research topics of NOAA CCME scholars necessitates broadening of NOAA collaborators and mentors. NOAA personnel often serve as NOAA/NERTO mentors and as members of thesis/dissertation committees for NOAA CCME Graduate Scholars. 1.3, 1.5 Relevant funding opportunity calls are routinely circulated to NOAA CCME faculty. NOAA CCME faculty write joint proposals for NOAA mission-relevant research. NOAA CCME faculty collaborate on student research projects through participation on student committees. Collaborative research projects involving multiple NOAA CCME investigators result in funded projects of NOAA mission relevance. 1.4 NOAA CCME Scholars all receive training in Big Data tools through the CWCC online modules and in-person instruction including course material demonstrating student discovery and access of NOAA datasets on public servers using popular software (e.g., R). 1.5 In addition to 1.3 above, the NOAA CCME monthly webinar series is used to promote inter-institutional discussion and exchange of ideas to develop collaborations. NOAA CCME Graduate Scholars present their research synopses to focal area groups with participation from all NOAA CCME institutions to ensure alignment with NOAA's mission and to facilitate inter-institutional discussion.
Outcome 2. CSC-supported faculty, staff and students' research directly aligned with NOAA's mission and strategic priorities. *Outputs* 2.1. Number of peer reviewed publications, presentations, and tools developed by faculty, staff and students. 2.2. Use of CSC research results and tools by NOAA and other stakeholders. 2.3. Number of instances CSC publications are cited.	2.1. All publications, presentations, and tools produced by NOAA CCME staff, faculty and students are reviewed by NOAA CCME, with the DRS and Data, Communication and Information Manager (DCIM) as points of contact, to ensure proper acknowledgement of NOAA CCME funding prior to counting them as NOAA CCME products. 2.2, 2.3. The DCIM will serve as the point of contact for submission and sharing of publications, data, and tools produced by NOAA CCME faculty, staff, and students. Publications and tools resulting from NOAA CCME research will be highlighted on the NOAA CCME website, increasing their visibility and likelihood for use in other research and citation. Publications will also be uploaded to the NOAA repository. Datasets and tools will be archived with GRIIDC and/or NCEI for community use.

NOAA EPP/MSI and NOAA CCME Outputs/Outcomes*	Process
2.4. Number of CSC students, staff or faculty recognized nationally for CSC research.	2.4. Visibility of NOAA CCME scholars, faculty and staff is enhanced through their presentations in national conferences and publications, increasing the chances that their outstanding contributions to research will be rewarded. Information regarding recognitions and awards will also be captured through semiannual progress reporting and evaluation reporting shared with the NOAA CCME External Evaluator.
5.3 CSC Administration	
Outcome 1. Increased CSC capacity to support and sustain education and research in NOAA mission areas. *Output* 1.1. Amount of funds leveraged with CSC award to support NOAA mission in education and research.	1.1 Information regarding leveraged funds awarded are collected monthly through monthly reporting by NOAA CCME faculty to NOAA CCME with the DRS and DCIM as points of contact.
Outcome 2. Increased engagement by CSCs with the URM communities to enhance the mission workforce pipeline. *Output* 2.1. Number of structured activities to recruit and retain students, particularly from URM communities, in NOAA mission-relevant higher education programs. 2.2. Number of MSI inter-institutional collaborative partnerships established and maintained in support of NOAA's mission.	2.1 NOAA CCME recruitment expands existing recruitment strategies for each partner institution. See Section V. of this Implementation Plan, Participant Recruitment and Support 2.2 NOAA CCME is comprised of 6 MSI institutional partners. Development of the Center-Wide Core Competency course (CWCC) required center-wide collaboration of all NOAA CCME partner institutions.
Outcome 3. To increase communication of CSC accomplishments and capacity. *Output* 3.1. Number of CSC products used by stakeholders.	3.1 – 3.2 Use of NOAA CCME products and number of featured articles referencing the NOAA CCME will be tracked through the monthly Focal Area and Partner Institution reporting collected from NOAA CCME faculty.

NOAA EPP/MSI and NOAA CCME Outputs/Outcomes*	Process
3.2. Number of featured articles in print or digital media referencing the NOAA CSC.	
Outcome 4. Increased use of post-secondary education evaluation methodologies. *Output* 4.1. Number of best practices that are measurable, scalable and transferrable. 4.2. Consistent use of established evaluation practices, including higher education practices, to measure effectiveness of each component of the award.	4.1 - 4.2 The five primary evaluation methodologies used are measurable, scalable and transferrable. NOAA CCME utilizes the following formative and summative evaluation methodologies for education outcomes and student progress: 1. CWCC evaluation through Blackboard pre and post-test, 2. Individual Student Development Plan semester reviews, 3.Taskstream project review process, 4. student research presentations through NOAA CCME webinar and student meetings, 5. student respondent surveys to improve Center processes. 4.2 The analytical report provided by the external evaluator uses established metrics to measure the effectiveness of each component of the award. 4.2 The NOAA CCME External Evaluator reports annual results of evaluations collected to inform future decisions, streamline processes, and improve student retention and graduation.
The overall Program level metrics for this FFO are: 1. Annually, number of EPP-funded post-secondary students from underrepresented communities who are trained and graduate in NOAA-mission sciences. 2. Annually, number of EPP-funded post-secondary students who are trained and graduate in NOAA-mission fields relevant to this announcement. 3. Annually, number of EPP-funded graduates who enter the NOAA mission workforce as hires by NOAA, NOAA contractors, NOAA partners, or resource management agencies, or academia or as entrepreneurs. 4. Annually, number of EPP-funded graduates who participate in and complete agency mission-related postdoctoral level programs.	1. - 4. Demographics may be determined through query of the NOAA CSC Student Tracker System. 5. Information regarding leveraged funds awarded are collected monthly through monthly reporting by NOAA CCME faculty to NOAA CCME with the DRS and DCIM as points of contact.

NOAA EPP/MSI and NOAA CCME Outputs/Outcomes*	Process
5. Funds leveraged with NOAA EPP award (including post-secondary student support).	

*****_Cited from pages 7-11 of the Financial Assistance to Establish Four NOAA Cooperative Science Centers at Minority Serving Institutions Announcement of Federal Funding Opportunity_ (FFO) (NOAA-SEC-OED-2016-2004758) (with output reference numbers added by NOAA CCME Evaluation Team)

III. Center Administrative Function

Florida Agricultural and Mechanical University (FAMU) is fully committed to the success of NOAA CCME. The Educational Partnership Program's goal to increase the number of students from underrepresented communities educated and trained in NOAA related disciplines aligns strongly with the mission of Florida Agricultural and Mechanical University. In order to meet the challenges presented by a collaborative of the scale of the NOAA CCME, FAMU recognizes that experienced programmatic leadership is essential. Therefore, the University has selected Larry Robinson to serve as the Principal Investigator and Director of the Center. In this capacity, Dr. Robinson will have the responsibility to oversee the strategic direction and programmatic functions of the Center, expand partnerships with NOAA facilities and other collaborators, and ensure the satisfactory performance of all partners. Florida A&M University believes that Dr. Robinson is highly qualified for this leadership role due to his many years of scientific leadership experience. Dr. Michael Abazinge will serve as the Associate Director and assist Dr. Robinson with the day-to-day execution of Center activities. The complete administrative structure is shown in Figure 2.

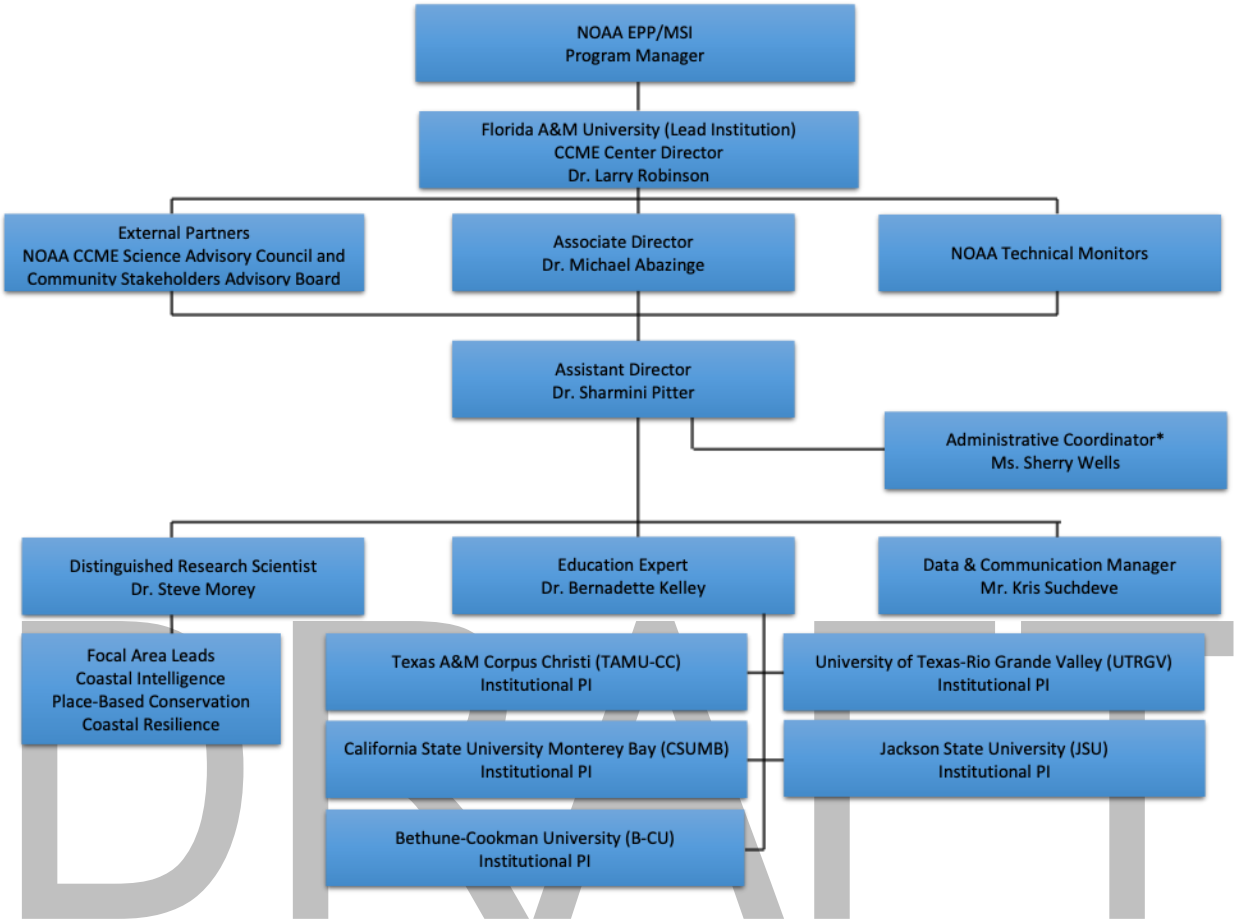


Figure 2. NOAA CCME Administrative Structure

**Position funded by Florida A&M University*

Center Administration

The **Center Director** (**CD**) is responsible for the overall management of NOAA CCME, including: direct communication with NOAA Office of Education, Educational Partnership Program; directing fiscal and personnel matters; coordinating and planning Center activities; assessing implementation of goals and objectives; representing the Center in NOAA-mandated activities; ensuring that all reporting requirements are met; and serving as the primary interface to NOAA program management. The CD in collaboration with the Associate and Assistant Directors will work with the NOAA CCME Technical Monitors and Advisory Councils to ensure that research goals and student training activities are aligned with NOAA research priorities and to identify strategies and implement procedures for: a) networking Center scientists and student researchers and activities into NOAA; and b) disseminating research findings and products to NOS and the broader NOAA community and other relevant local, regional, and national stakeholders.

The **Associate Director** (**AD**) will act on behalf of the CD and represent the CD in his absence. Both the CD and the AD will collaborate on all Center activities to ensure success and efficient functioning of the Center. The AD will work collaboratively with the Education Expert to track NOAA CCME students to ensure their success.

The **Assistant Director** (**AAD**) will work with the Center Director and Associate Director to administratively assure effective and timely accomplishments for award objectives, reporting, products and outcomes generation. The Assistant Director will allocate 100% effort to NOAA CCME activities. Activities include day-to-day Center administration, budget tracking, oversight and coordination for execution of all Center plans and timelines, meetings, and engagement with internal and external groups to promote the Center. The Assistant Director working with the Associate Director and the Center Director will plan and coordinate Center meetings at a NOAA facility at least 9 months before the award anniversary; Advisory Board Meetings; Center Student Seminar Series; Monthly Center-wide Meetings with NOAA Technical Monitors, NOAA EPP/MSI and Principal Investigators.

The **Distinguished Research Scientist** (**DRS**) is responsible for coordinating research activities across the Center, facilitating production of peer-reviewed publications, facilitating interactions with NOAA and other scientists, assisting in the acquisition or leveraging of supplemental extramural funding, and mentoring students throughout the Center. Additional duties of the DRS include playing a key role in organizing Center-wide activities such as the CWCC, Ecosystem Day, specialized workshops, "Big Data" Boot Camp, the NOAA EPP Education and Science Forum, and the Cross-Center Collaboration.

The **Education Expert** (**EE**) is part of the Center leadership and will lead implementation of the Education Plan and ensure that all Center supported students have acquired/trained in skills and competencies for agency future workforce. The EE is also responsible for coordinating Center-wide training activities, including the CWCC, disseminating the achievements of the Center, internal assessments of the Center, and coordinate and guide student opportunities for professional development activities, and preparing application packets for experiential opportunities.

The **Data, Information and Communications manager** (**DCM**) will work with the NOAA CCME Education Expert to track student progression, monitor student tracking data and information systems, communicate center achievements for high visibility with internal and external stakeholders and manage the Center's website. The Data Information and Communications Manager will allocate 100% effort to NOAA CCME activities and will be responsible for facilitating the process that produces the Center performance report and annual NOAA CCME student tracker deliverables.

An additional administrative position, the **Administrative Coordinator,** has been provided by Florida A&M University in support of the NA16SEC4810009 award. Florida A&M University has provided funding for an Administrative Coordinator position in demonstration of the University's support of the NOAA CCME award and to enhance the functions of the Center. This position was created to ensure successful implementation of the award. The Administrative Coordinator (AC) will be responsible for facilitating communications and services to the NOAA CCME partners and the FAMU community. The AC will schedule and organize complex activities such as meetings, travel, conferences and other NOAA CCME activities. The AC will be responsible for maintaining the filing system for the Center and work with a diverse group of external partners and visitors as well as internal contacts at all levels of the Center and Lead Institution and will provide other clerical support and duties as needed.

The seven-member NOAA CCME Science **Advisory Council** (**NOAA CCME SAC**) will consist of two (2) NOAA scientists and five (5) members from academia and other federal agencies. The Advisory Council will help to ensure alignment and relevance of NOAA CCME education research and outreach activities. The Council will also assist in the establishment of collaborative opportunities for NOAA CCME faculty and students. Council members will serve during the 5-year funding period. Selection and replacement of members will occur by nominations and vetting by the Center Management Team.

The **Community Stakeholders Advisory Board (CSAB)** will consist of members selected from key areas in which NOAA CCME education, research and outreach activities occur. These local stakeholders will facilitate outreach activities, serve as conduits to local issues and concerns, and provide input into NOAA CCME research initiatives in their respective communities. Members of CSAB will serve during the 5-year funding period and will be nominated by NOAA CCME institutions, Focal Area Leads, and other stakeholders.

The **Center Management Team** (**CMT**) will consist of the CD, AD, AAD, DS, EE, and the Focal Area Leads, and the Institutional PIs. Collectively, the CMT will be responsible for providing oversight of the education, training and research activities, and ensuring the implementation of Center goals and objectives. The planning of all activities at NERR sites and Sanctuaries and GCOOS will be facilitated through the Center. The DS will lead among other duties, achievements of the Science Plan, conducting research meetings, managing all Center research projects, research accomplishments and writing successful grant proposals.

Center Financial Management

The day-to-day financial management of the center is the responsibility of the Center Director, Associate Director, Assistant Director, and Director of Sponsored Programs (FAMU). The Center Director is responsible for all administrative final decisions. In the absence of the Center Director the Associate Director will assume the duties and responsibilities of the Director. The budgets of

both lead and partner institutions (sub-awards) will be monitored by the Budget Coordinator (FAMU). The Center Director shall make final decisions for financial and budget functions. The Director of Sponsored Programs (FAMU) is also responsible for sending out information and other relevant information to sub-awardees. The various responsibilities for producing and completing Education and Research/Scientific projects and Special Award Conditions are detailed in the sub-awards recipient agreements. The lead institution will ensure all project documents including the Implementation Plan, are updated and maintained via monthly teleconference calls and internal center reports for updating center information. The lead institution will also liaise with NOAA-EPP, Technical Monitors, NOAA CCME Advisory groups, and with all stakeholders via teleconference calls, annual meeting and other scheduled meetings, as needed. NOAA CCME will institute monthly teleconference calls with all sub-award recipients. Additional focal areas of research will initiate teleconference calls as needed to ensure success in student training and scientific research. A virtual meeting in which all students participate will occur at the beginning of each semester to discuss research projects, how best to align their research with NOAA needs, and to get updates on NOAA experiential opportunities. Data related to student funding is reported monthly by the sub-awardees to the lead institution for review and compilation. Information is uploaded into the Student Tracker database system and grants online. Semiannual reports related to degree programs, number of students, and products generated from research activities are sent electronically by the sub-awardees to the lead institution.

The Performance Reports from the Center will be submitted by the Assistant Director of Sponsored Programs (FAMU) and Financial Reports submitted by the Office of Contracts and Grants.

Key Success Criteria

The lead institution (FAMU) has the responsibility to adhere to all financials and fiduciary accountability and reporting. The Center Director along with the Financial Management Lead will maintain appropriate records, and file the required financial reports as deemed necessary. As the lead institution, FAMU holds all academic partners to the same requirements.

IV. Center Post-Secondary Education and Training Function

EDUCATION AND TRAINING PLAN

Utilizing the strategy of "teaching through research," adapted from TAMU Oceanography (TAMU Oceanography, 2016.), NOAA CCME scientists and students will employ an integrated research approach to develop products in support of NOAA's management and stakeholder goals. NOAA's goals are articulated in the NOAA Strategic Plan and the NOS Roadmap. Among these goals in the roadmap are efforts to transform large datasets to further develop coastal environmental intelligence and communicate science supported place-based conservation practices for healthy oceans, resilient coastal communities, economies, and ecosystems. The NOAA CCME will utilize

research as a mechanism to train students and develop their coastal and marine ecosystem competencies and skills.

Students will be required to enroll in a suite of predetermined courses at their home institutions that will provide foundational knowledge of core natural and environmental science and policy concepts relative to the Center's focal areas. Students will further develop the knowledge and skills needed to engage in the workforce by participating in interdisciplinary research and professional development activities. NOAA CCME Scholars will complete NOAA CCME-wide courses and training modules and NERTO (NOAA graduate internships), conference participation, and submission of manuscripts to refereed journals. Students will learn to engage in outreach with coastal communities and stakeholders and participate in the recruitment and retention of other students through peer mentoring.

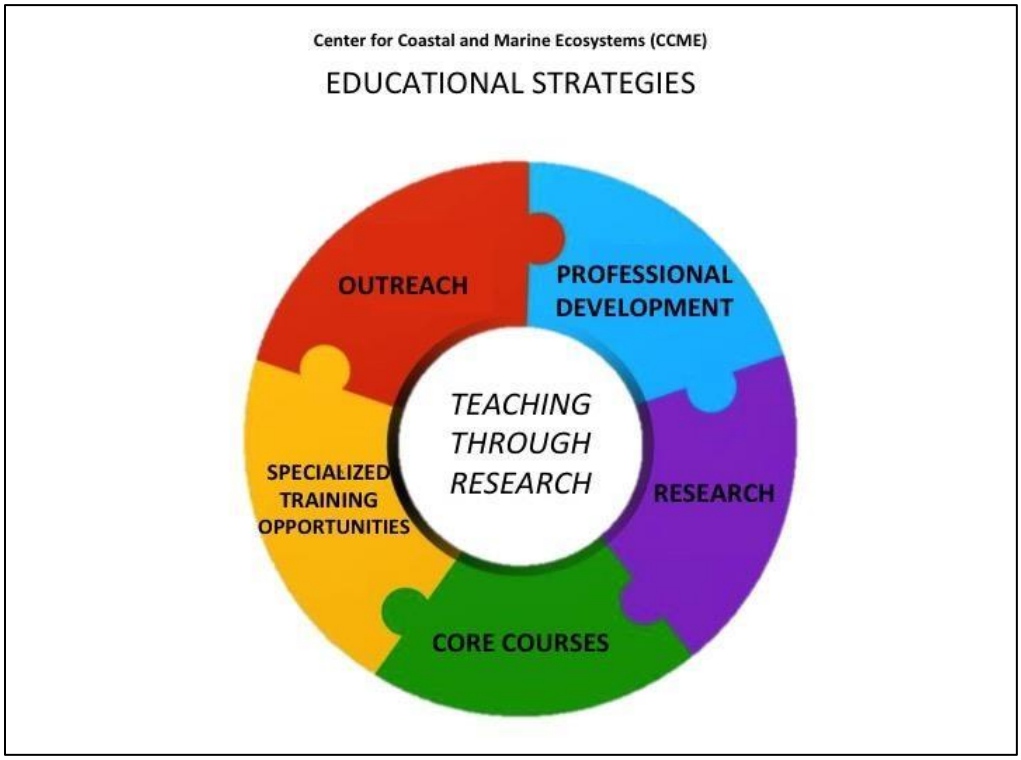


Figure 3. *Model of NOAA CCME Educational Strategies.*

The Center will use the following mechanisms to ensure students acquire the competencies needed to contribute to NOAA's future workforce needs:

- Require students to select from a predetermined suite of NOAA-relevant academic degree programs
- Provide workshops and specialized training opportunities in the utilization of "Big Data" and Geographical Information Systems (GIS)

- Expose students to the Center-Wide Core Competency (CWCC) course that focuses on integrated socioeconomic and ecosystem-based problem solving
- Implement a faculty-mentored student research program in collaboration with NOAA scientists
- Facilitate internship opportunities with NOAA and related partners
- Initiate the Student Professional Development Program (SPDP)
- Involve students in the planning and implementation of a series of activities showcasing NOAA CCME (e.g., Local Ocean Week and Earth Day events)

Education and training function is the major priority of the NOAA CCME and while NOAA and its partner agencies recruit their scientists and managers primarily from the natural sciences, there is a growing awareness of the need for social science training. NOAA CCME faculty with social science expertise will be used to serve on graduate research supervisory committees and provide instruction in the social and behavioral sciences necessary to adequately prepare students focusing in these areas. NOAA CCME stakeholders from coastal communities will be provided opportunities to learn how environmental decisions impact the social and economic structure of their communities. These activities contribute to NOAA's strategic priority of promoting environmental literacy.

The education program will be realized through the implementation of NOAA CCME Goal 1*: Recruit, train, and graduate students, particularly from underrepresented minority communities, with the competencies and skills that support NOAA's Education Strategic Plan's future workforce goals and objectives*. Specific objectives associated with this goal are listed below:

1a. Provide financial support, education and training experiences for undergraduate students, graduate students, and postdoctoral fellows through teaching and mentoring provided by NOAA CCME faculty.

1b. Leverage new and existing partnerships with community colleges and high schools to recruit and prepare students for NOAA-relevant degree programs at NOAA CCME institutions.

1c. Utilize the Center-Wide Core Competency (CWCC) course to ensure student proficiency in NOAA CCME focal areas.

1d. Expose students to broader research and experiential learning opportunities such as Student Scholarship Internship Opportunities (SSIO) and NERTO, as well as through partnerships with NOAA and other scientists.

The NOAA CCME will utilize the following activities in Table 3 below to meet its educational goals.

Table 3 Educational Activities and Associated Objectives to meet NOAA CCME goals

Educational Activity	Related Educational Objective (above)
Enroll students in NOAA CCME academic programs *(see expanded discussion below)*	1a
Recruitment at area community colleges and local high schools	1a, 1b
Recruitment from specialized programs for high school students such as the NSF funded REU program at CSUMB and the NSF funded Geosciences Bridge Summer Program hosted by University of Maryland Eastern Shore, and NOAA CCME Partner Summer Camps, and freshman research experience programs at NOAA CCME partner institutions Rising sophomores will be prepared for summer experiential opportunities in NOAA and other agencies particularly the Hollings and EPP Undergraduate Scholarships programs.	1a, 1b
NOAA CCME webinars	1a
Individual Student Development Plans (ISDP)	1a, 1d
Faculty-mentored research programs	1d
CWCC	1c
Experiential learning opportunities	1d
"Big Data" Boot Camp	1d
GIS Certificate Program	1d
NOAA CCME Postdoctoral program	1a, 1d

Partnership Expertise and Degree Offerings

NOAA CCME leverages new and existing courses and degree programs. For a complete listing of degree programs please see Appendix VII Student Competencies.

Center-Wide Core Competency Course (CWCC)

To ensure that students understand how their classroom and research experiences fit into a broader context of NOAA CCME goals and objectives, the Center will require student participation in the CWCC. The principle goal of the CWCC is to ensure students obtain knowledge of how to integrate natural and social sciences into solutions to real world problems associated with coastal communities and ecosystems.

The CWCC will address various demands placed on coastal ecosystems and communities including natural and anthropogenic stressors, and their impacts on ecosystem processes and services and local socioeconomic attributes. For example, the northern Gulf of Mexico contains significant energy resources, as well as major fisheries and recreational activities. The CWCC will discuss interactions among these critical activities. An additional example will also discuss the impacts of anthropogenic stressors, including temperature changes, sea level rise, changes in frequency and severity of storms, and ocean acidification on coastal ecosystem services, and how these changes affect distributions and uses of resources in coastal environments.

These integrative learning experiences will strengthen students' understanding of complex issues confronting coastal and marine ecosystems and communities. By merging planning, delivery and coordination among all NOAA CCME partners including NOAA scientists, a substantial change in science education for all NOAA CCME students will be achieved. Traditional delivery and distance learning approaches will augment the basic competencies derived from current degree offerings.

To ensure that the students develop specific skills relevant to NOAA CCME focal areas, the CWCC will also address the:

- evaluation of various human use demands placed on coastal systems;
- exploration of management approaches and policies for balancing demands with ecosystem health, functionality and resilience;
- application of techniques used in site characterization;
- assessment and valuation of ecosystems;
- utilization of ecological models; and
- analysis of policy making paradigms and socioeconomic issues.

"Big Data" Analytics Summer Boot Camp

All NOAA CCME students will be required to participate in a two-week online experience designed to provide an academic overview of various strategies and techniques associated with data analytics., In addition, the boot camp will immerse students in activities designed to strengthen their proficiency in the understanding and use of large data sets in research. In

addition, students will participate in tours, workshops, seminars and interactive group learning exercises, and network with researchers skilled in Big Data and geospatial analysis.

NOAA CCME Student Development Plan

The NOAA CCME Student Development Plan (SDP) will involve two components: academic development and professional development. The academic development component will be defined by a series of steps designed to increase retention, academic progression and graduation. Each student participant will be assigned a NOAA CCME advisor to ensure knowledge of degree requirements and special program requirements of NOAA EPP-MSI. Every student will receive a written notification, a "Letter of Understanding" (LOU), which outlines all program eligibility requirements extracted from the Special Award Conditions Handbook. NOAA CCME advisors will be required to forward a signed student LOUs to the Center Director for record keeping on a semester basis. Each student at each degree level will be supported to complete their degree programs. Faculty mentoring of student research projects will be a critical element of the SDP.

The NOAA CCME will expand upon its existing rising sophomore experiential program which pairs students with seasoned researchers during the academic year. NOAA CCME initiates contact with students during the Spring of their freshman year to increase awareness of NOAA undergraduate scholarship opportunities. NOAA CCME faculty then guide students through research opportunities and the scholarship application process as part of their rising sophomore experiential training. Each of the application opportunities requires a written description of a NOAA-relevant project at the outset which is reviewed by NOAA CCME management. Resources are provided in support of the project to ensure successful completion. At the conclusion of the project, upon the approval of the NOAA CCME Director, students will be provided funding to present their work at conferences and symposiums.

NOAA CCME has a variety of activities within its partner institutions that are in alignment with the rising sophomore experience. NOAA CCME CSUMB hosts a summer REU program students embedded in research experiences to increase their level of expertise in NOAA mission related research. NOAA CCME JSU has a research experience led by a NOAA CCME faculty mentor. Through this experience students explore research techniques in Gulf of Mexico habitats. NOAA CCME FAMU builds upon required freshman research experiences and on-campus Living Learning Communities to pair undergraduate students with NOAA CCME faculty to gain critical research experiences. Wide exposure to these opportunities occurs throughout partner institutions with NOAA CCME hosted webinars at the beginning of each Fall term. The Center Director hosts a meeting, which is followed by center-wide webinars that introduce students to NOAA CCME and NOAA scholarship opportunities.

NOAA CCME Institutional PIs have a more focused training and evaluation of their NOAA CCME Scholars for various NOAA Fellowships including Knauss, EPP Undergraduate Scholarship Program and Hollings Scholarships, including meetings during the Fall semester to maximize attendance and participation. During bi-weekly scholar meetings students receive assistance in writing and other professional development skills to prepare an application for submission.

Center-wide webinars also include NOAA personnel to present seminars on various topics including the Knauss Fellowship, Federal job placement, and the Hollings and EPP Undergraduate Scholarship Programs.

In preparation of the rising sophomore experiences, NOAA CCME is also in partnership with the LMRCSC Summer Geosciences Program to prepare incoming freshman with scientific research experience.

At the NOAA CCME Center level, the Distinguished Research Scientist, Assistant and Associate Directors, and Institutional PIs at the institutional level are available to review all applications to ensure competitive applications.

NOAA CCME faculty will assist students in the preparation of resumes and applications for summer internships including the NOAA EPP Undergraduate Scholarship Program, the Hollings Scholarship Program, as well as other relevant scholarships, fellowships, and experiential training opportunities that will contribute to the knowledge, workforce preparation and post baccalaureate educational experiences.

Students will enhance written and oral communication skills through preparation of abstracts, manuscripts, theses, dissertations, and conference presentations. All graduate students will be required to present at the NOAA EPP Biennial Education and Science Forum.

Individual Student Development Plan

The Individual Student Development Plan (ISDP) will be used to ensure that each student receives personalized guidance during their matriculation at their respective NOAA CCME institution. Each ISDP will be developed in consultation with the student, faculty advisor, NOAA CCME staff, and NOAA partners or collaborators when appropriate. Each plan will factor in the student's degree program and academic level, i.e., BS, MS or Ph.D. Each ISDP will include an academic map, an experiential activity plan, a research plan, and a career pathway plan. Each student at each degree level will be supported to complete their degree programs. Faculty mentoring and peer mentoring will be used to facilitate student progression. Each ISDP will be monitored and accessed by faculty mentors and NOAA CCME staff.

Targets, Competencies, and Milestones

The NOAA CCME is preparing students to gain competencies and skills to be competitive candidates for the future NOAA mission workforce. The three focal area groups have developed NOAA CCME targeted educational competencies by academic level as shown in Table 4**.** These competencies will be tracked and assessed as indicated in the Center's *Plan for Evaluation* in the Center Administration Plan below.

Table 4 Student Competencies by Academic Level for NOAA CCME Scholars

Undergraduate Level Competencies	Attainment Mechanisms
Utilization of large datasets Increased understanding of coastal and marine ecosystem processes and socioeconomic issues	• "Big Data" Boot Camp • Experiential-Participation • CWCC • Coursework • Undergraduate Research Projects
Graduate Level Competencies	Attainment Mechanisms
Transformation of large datasets into useful environmental intelligence Development of decision-support tools that promote coastal and marine ecosystem vibrancy Application of geospatial tools in research Attain skills to conduct research on coastal and marine processes, socioeconomic issues, and policy issues	• "Big Data" Boot Camp • Experiential-Participation • CWCC • Coursework • Graduate Research Projects • GIS certificate training course

Key Success Criteria

The key objective for the Education and Outreach functions is to increase the number of graduates in NOAA relevant science majors, and STEM areas poised and ready to enter graduate school, or the NOAA or NOAA related workforce.

V. Center Scientific Research Function

RESEARCH SCIENCE PLAN

Training the next generation of NOAA scientists (natural and social) will require an interdisciplinary approach. Resource managers and stakeholders are asking for a stronger connection between what is taking place in the natural environment around them and how the environment impacts their communities and well-being. The NOS Roadmap explicitly recognizes this challenge by connecting the bio-physical science in Coastal Resilience, Coastal Intelligence, and Place-Based Conservation with human resilience and economies. To successfully support the NOS Roadmap, and more importantly, to bring about lasting change in how scientists conduct their work, a top priority for the NOAA CCME is to train students with an interdisciplinary approach in mind from their introduction to the program coupled with experiential learning opportunities in the communities where scientific research is conducted. This integrated approach also supports NOAA's Social Science Vision and Strategy as well as priorities within the Strategic Research Guidance Memorandum.

To ensure that NOAA CCME training and research activities are focused and integrative as well as advance the NOAA CCME education and scientific goals and are in line with NOAA NOS mission and roadmap, we have established an internal procedure to solicit, review and approve research projects to be performed by NOAA CCME student and researchers. This procedure will guide decisions about NOAA CCME funding of specific training and research projects. Guidance in developing NOAA NOS and OAR relevant projects will be provided by collaborative NOAA scientists, NOS Roadmap, the NOAA Social Science Vision and Strategy, input from NOAA technical monitors, the Community Stakeholders Advisory Board, and the NOAA CCME Advisory Council. With the above inputs, NOAA CCME faculty and students will develop a one-page project synopsis to be reviewed by the relevant NOAA CCME Focal Area, the NOAA CCME Leadership Team and the NOAA Educational Partnership Program for alignment with the Center's goals and NOAA's priorities, respectively. Review criteria will include integrated training, technical and scientific merit. Based upon the reviews, the final funding decision for a specific project proposal will rest with the Center Director.

The NOAA CCME faculty will train undergraduate, graduate, and postdoctoral fellows in the three focal areas of Coastal Resilience, Coastal Intelligence, and Place-Based Conservation. The training will drive the research and be integrated with the social sciences. Each focal area has identified key NOAA-mission aligned core competencies which guide student training activities to ensure NOAA CCME Scholars receive the skills needed to be competitive applicants for the future NOAA workforce (Appendix VII).

Communication of research results will be vital for the overall success of the NOAA CCME goals for training and research. Both NOAA CCME students and faculty from different institutions will regularly meet via web-based conferencing to discuss the science and the policy both driving and derived from the science, and to participate in the NOAA CCME center-wide seminar series. To further student professional development, graduate students will participate in NOAA Experiential Research and Training Opportunities (NERTO) with funds allocated for this purpose. Students will be expected to visit the NOAA scientist who will serve as their NOAA and/or NERTO mentor and contribute to the development of the student's research project. The student will be encouraged to visit other NOAA laboratories when necessary to refine additional skills. Undergraduate students will be mentored and assisted to apply for NOAA Student Scholarship Internship Opportunities (SSIO).

VI. Appendices

Appendix I: Points of contact

1. Center Director;
Dr. Larry Robinson, Principal Investigator, President, Florida A&M University
1515 Martin Luther King Blvd, Tallahassee, FL 32307
850-599-3550; fax 850-599-8183;
Larry.robinson@famu.edu

2. Associate Center Director;
Dr. Michael Abazinge, Co-Principal Investigator, Professor,
Florida A&M University-School of the Environment
Michael.abazinge@famu.edu

3. Assistant Director;
Dr. Sharmini Pitter
Florida A&M University-School of the Environment
Sharmini.pitter@famu.edu

4. Distinguished Research Scientist;
Dr. Steven Morey
Florida A&M University-School of the Environment
Steven.morey@famu.edu

5. Data, Communication Manager;
Mr. Kris Suchdeve,
Florida A&M University-School of the Environment
Kris.suchdeve@famu.edu

6. Education and Outreach Lead
Dr. Bernadette Kelley, Associate Professor; **Florida A&M University – College of Education**
Bernadette.kelley@famu.edu

7. Financial Management Lead;
Ms. Cynthia Henry
Florida A&M University-Office of the President
Cynthia.henry@famu.edu

Appendix II: Outputs and Outcomes

Appendix Table 1 Outputs and Outcomes by Year

Project Function	**Outputs/Outcomes**	**Milestones (6-month intervals) over 5 years**	**Year(s)**
Education/Science Research	Train students' in NOAA-related STEM fields Develop/Assign recruited students to various NOAA CCME research projects	Recruit students/Assign students to faculty and mentor advisor Develop a research prospectus for each recruited student Report student research progress by faculty advisors to the Center leadership.	**1st Cohort YR 1** 12 Ph.D. 21 MS 17 BS 7 Community College **2nd Cohort YR 2 – Due to delay of the release of Year 1 funds recruitment to occur in Year 2 to fill remaining spots available from Cohort 1.** Ph.D. MS BS Community College **3rd Cohort YR 3** Ph.D. 22 MS 7 Community College

Education/Science Research	Train NOAA CCME faculty, Post-Docs, Peer Student mentors in the required elements of serving as a mentor Implement the Student Development Plan (SDP) for all NOAA CCME recruited students. The SDP has two components: academic development and professional development. A "Letter of Understanding" (LOU), which outlines all program eligibility requirements extracted from the Special Award Conditions Handbook Graduate students will participate in NOAA Experiential Research and Training Opportunities (NERTO) Undergraduate students will be mentored and assisted in applying for NOAA Student Scholarship and Internship Opportunities	Provide mentor training for faculty and peer-mentors Each plan will factor in the student's degree program and academic level, i.e., AA, BS, MS or Ph.D. Each SDP will include an academic map, an experiential activity plan, a research plan, and a career pathway plan. Faculty mentoring and peer mentoring will be used to facilitate student progression. The Individual Student Development Plan (ISDP) will be used to ensure that each student receives personalized attention during their matriculation at their respective NOAA CCME institution. Semi-annual reports will provide information and participation of students in NOAA NERTO opportunities. Develop a website to facilitate student recruitment, communicate center activities, scholarship/internship opportunities, and services/products to academia, NOAA, and other stakeholders	1,2,3,4,5

Education/Science Research	Implement the NOAA CCME Center-Wide Core Competency (CWCC), Big Data, Geographical Information Systems (GIS) courses for all recruited students Train all NOAA CCME students in Social Science methods/data usage related to NOAA's mission	Define and/or revise curriculum and enroll students In the Big Data Boot Camp, GIS Online Course, or Center-Wide Core Competency course (CWCC) all of which will include elements of Social Science research aligned with Center focal areas and NOAA's mission	1,3,5
Education/Outreach/ Science Research	Develop and host monthly NOAA CCME webinar series to enhance student training and professional development	Identify webinar topics and enlist webinar leaders to include NOAA scientist/mentors to deliver webinar series. Assess the effectiveness of webinar series through evaluations by students, faculty, NOAA scientists and staff. Feed results into assessment and evaluation plan.	1,2,3,4,5

Project Function	Outputs/Outcomes	Milestones (6-month intervals)	Year(s)
Education/Science Research	Graduate at least 24 Bachelors, 22 Master's and 12 Ph.D. students, who are well trained, in NOAA-mission sciences who are well prepared to enter the NOAA and NOAA related workforce. Place emphasis on the recruitment of students from underrepresented populations in NOAA related sciences.	Monitor student demographics during the recruitment phase and the progression of students in their academic programs. Identify the number of graduates each academic semester and monitor student demographic data pertaining to graduates.	1,2,3,4,5
Science Research	Submit and garner NOAA/NOAA CCME relevant leveraged funding. Identify relevant funding opportunities and encourage collaborative proposal development by NOAA CCME faculty and staff	Identify and record the number of proposals submitted by and awarded to NOAA CCME faculty and staff.	1,2,3,4,5
Education/Science Research	Enhance collaboration between NOAA CCME participants (faculty, post-doctoral fellows and students) and NOAA specialists and scientists resulting in cutting edge NOAA/NOS mission critical tools and products (i.e. data sets, peer reviewed publications, internal reports, maps and models)	Identify points of access to NOAA by NOAA CCME participants. Identify and document the number of presentations, workshops, publications, training opportunities, tools and products developed, and the number of NOAA scientist participating in student research projects during the funding period.	1,2,3,4,5
Education/Science Research	Enhance collaborations between NOAA CCME participants and NOAA CCME regional observing collaborators and/or local and regional coastal managers resulting in improved strategies for	Identify opportunities to collaborate with regional/local partners among and by NOAA CCME participants. Build, continue, and expand collaboration and partnership at regional levels.	1,2,3,4,5

	coastal resource management and planning in the Gulf of Mexico, Pacific coast and Florida's space regions	Identify the number of presentations, publications, training opportunities tools and products developed in collaboration with regional-partners during the funding period. Identify the number and percentage of student interns, collaborators, and NOAA CCME funded scientific research projects that occur in the GOM, Pacific coast and Florida's space coast regions. Communicate NOAA CCME's products to NOAA and stakeholders Identify the number of NOAA CCME products used or adopted by stakeholders	
Education/Outreach/ Science Research	Community college environmental science students to enter college and majoring in NOAA-relevant STEM or social science fields as a result of NOAA CCME recruitment and mentoring efforts.	Identify the number of community college students applying and accepted to college in the identified majors at all partner institutions	1,2,3,4,5

Project Function	Outputs/Outcomes	Milestones (6-month intervals)	Year(s)
Post-Doctoral Program	Recruitment of two post-doctoral research associates.	Recruitment and hiring of Post-Doctoral applicants.	1,2,3
Post-Doctoral Program	Post-Docs will prepare a research plan to include relevant NOAA/NOAA CCME research and work at a NOAA facility Present research findings at a NOAA and/or professional meetings	Identify the number of Post-doctoral presentations and publications. Communicate findings to NOAA and stakeholders via the NOAA CCME website and/or webinars	2,3,4,5
Education/Outreach/ Science Research Post-Doctoral Program	Provide community outreach opportunities by providing stakeholder groups with environmental intelligence, scientific research, data and products that impacts coastal and marine management and resilience Student developed novel products and methods for outreach to place-based communities, community leaders, and groups	Provide a number of community outreach meetings or programs attended for identified stakeholders. Provide and monitor access to products/materials/methods developed by the NOAA CCME students and faculty.	2,3,4,5

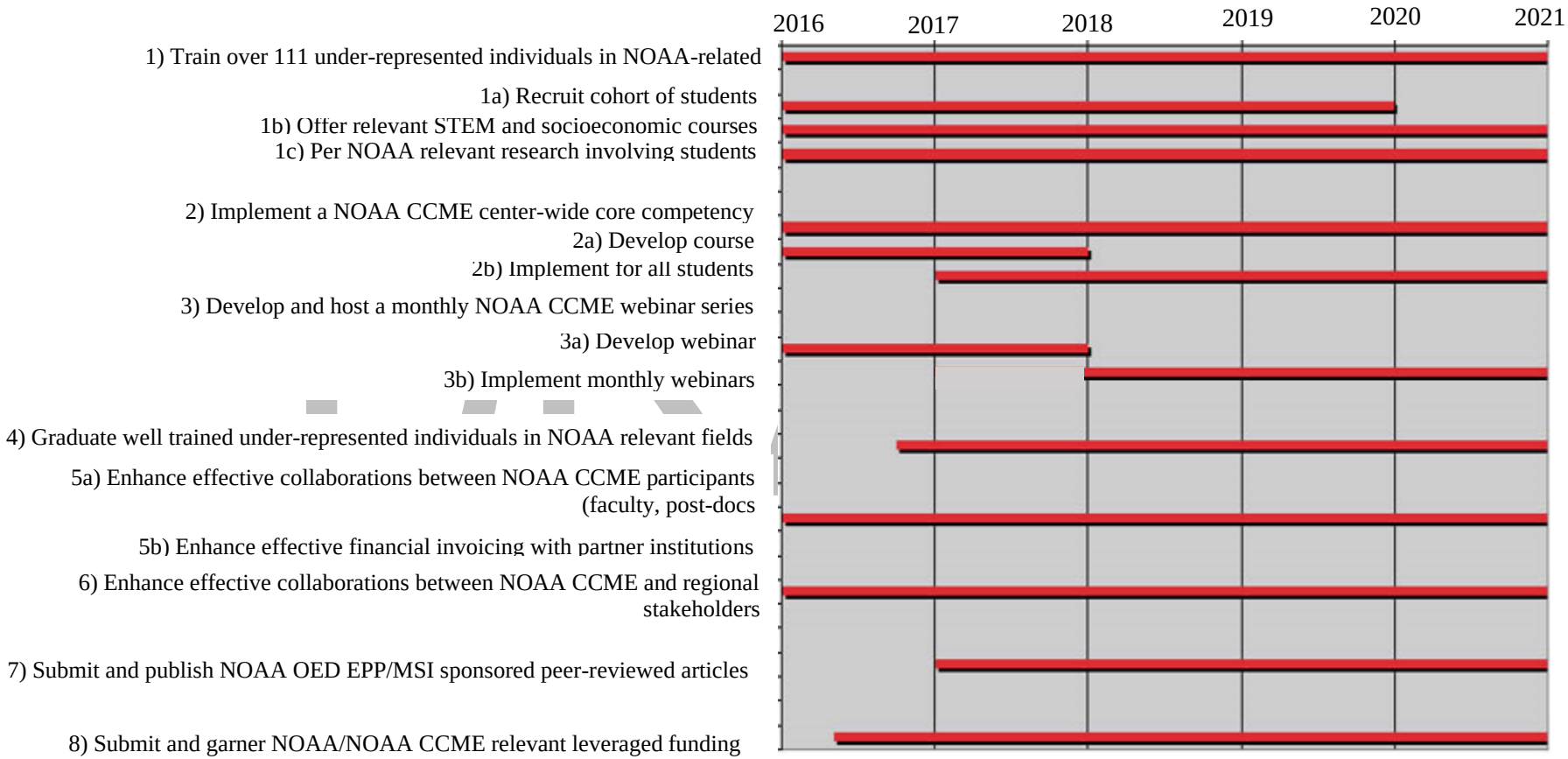
Project Function	**Outcomes**	**Milestones (6-month intervals)**	**Year(s)**
Center Management	Recruit program (1) Assistant Director and (1) Center Evaluator Develop a Center Evaluation Plan	Hire Assistant Director Hire an External Evaluator Submit Evaluation Plan to Program Office for approval	1
Center Management	Prepare and disseminate sub-awards	Report all sub-award contracts and financial reports	1,2,3,4,5
Center Management	Maintain project documents, to include Implementation Plan and Evaluation Plan. All plans and activities are updated and maintained via monthly teleconference calls and other reports for updating NOAA CCME information.	Provide monthly meeting agendas and reports	1,2,3,4,5

Project Function	Outcomes	Milestones (6-month intervals)	Year(s)
Center Management	Prepare required semi-annual and annual financial reports	Submit required reports	1,2,3,4,5
Center Management	Communicate with NOAA-EPP/MSI Program Office, Technical Monitor(s), Advisory Committee(s), and with all stakeholders via teleconference calls, NOAA CCME annual meeting and other scheduled meetings as needed.	Provide meeting minutes, reports, and agendas as required	1,2,3,4,5
Center Management	Provide data related to student funding as reported bi-annually by the sub-awardees to the lead institution for review and compilation and information is uploaded into the Student Tracker database system and Grants on-line.	Prepare bi-annually semiannual, progress reports that support the completion of the Student Tracker database system	1,2,3,4,5

Project Function	Outcomes	Milestones (6-month intervals)	Year(s)
Center Management	Provide reports related to degree programs, number of students, and products generated from research activities.	Prepare semiannual reports	1,2,3,4,5
Center Management	Oversee the preparation of Performance Reports and Financial Reports submitted by the Office of Contracts and Grants.	Prepare Center Performance Reports Prepare Center Financial Reports	1,2,3,4,5

Appendix III: Master schedule

Including milestones for Post-Secondary Education and Training, Scientific Research, Center Management, and Postdoctoral Program



Appendix IV: Glossary of terms

Anthropogenic stressors: human-caused factors or processes that negatively impact or stress biological and physical systems. Examples include pollutants, increased or decreased water flows, and land use changes.

Ecosystem services: the processes by which the environment produces products that support humans and other life. Examples include water purification, cycling of nutrients, and decomposition and detoxification of wastes.

Geospatial data: the data that are link to the geographic location and geometry of features such as landmarks, bodies of water, specific geological or topographic features, or plant types. Geospatial data is usually stored using a spatial reference and can be mapped or overlaid on other maps.

Hyperspectral (data or imagery): Hyperspectral imaging, or imaging spectroscopy, combines the power of digital imaging and spectroscopy. For each pixel in an image, a hyperspectral camera acquires the light intensity (radiance) for a large number of contiguous spectral bands. Every pixel in the image thus contains a continuous spectrum and can be used to characterize the objects in the scene. Specific bands can then be used to identify and quantify properties such as chlorophyll content, land cover, water color and turbidity, and other parameters.

Resiliency: the ability to adjust to or recover from change.

Stewardship: the responsible management, care and preservation of resources

Sustainability: the practices that ensure the continued availability of resources such as clean air and water, food, and materials to support humans and their environment.

Synergy: two or more entities working together to produce a result that neither could produce alone.

Trophic dynamics: the relationships among members of a food web, and the fluxes of materials and energy that move through food webs.

Webinar: a seminar or other professional presentation that is made available for viewing at a website. Webinars may be broadcast live or archived as links for future viewing.

Appendix V: Acronyms and Abbreviations

AAD: Assistant Director
AC: Administrative Coordinator
AD: Associate Director
ANERR: Apalachicola NERR
CD: Center Director
CEM: Conceptual Ecosystem Model
CMT: Center Management Team
CSAB: Community Stakeholder Advisory Board
CWCC: Center-Wide Core Competency course
DICM: Data Information and Communication Manager
DRS: Distinguished Research Scientist
E&O Lead: Education and Outreach Lead
Exec Comm: Executive Committee
FA: Focal Area
FGNMS: Flower Gardens NMS
GBNERR: Grand Banks NERR
GCOOS: Gulf of Mexico Coastal Ocean Observing System
GOMA: Gulf of Mexico Alliance
ISCRM: integrated science for coastal resource management
ISDP: Individual Student Development Plan
MA-NERR: Mission Aransas NERR
NERR: National Estuarine Research Reserve
NMS: National Marine Sanctuary
NOAA CCME: Center for Coastal and Marine Ecosystems
SAC: Science Advisory Council

IMPLEMENTATION PLAN ADDENDUM

Award Number NA16SEC481009

Lead Institution-Florida A&M University-Dr. Larry Robinson

School of the Environment, 1515 Martin Luther King Blvd., Tallahassee, FL 32307

Center for Coastal and Marine Ecosystems (NOAA CCME)

Partner Institutions

Bethune-Cookman University- Dr. Hyun Jung-Cho

California State University Monterey Bay-Dr. Corey Garza

Jackson State University-Dr. Timothy Turner

Texas A&M University-Corpus Christi-Dr. Richard McLaughlin

University of Texas Rio Grande Valley-Dr. David Hicks

Date of submission: July 2018

I. Identify and document NOAA CCME center-wide recruitment strategies and responsibilities to gain student output for funded award.

Recruitment activities will be conducted internally by NOAA CCME faculty and staff, and externally with coordinated efforts of university-provided recruiters. External recruitment activities will be conducted at national and regional recruiting events at high schools and community colleges.

Thus far NOAA CCME faculty and staff have participated in recruitment activities during key scientific meetings and conferences as well as online advertisement through professional communities. Center-wide distribute press releases and additional marketing tools to enhance exposure of the Center to students as well as a broader collection of stakeholders. Center-wide recruitment efforts have also involved email and telephone contact, information sessions, and Facebook advertisements.

PARTICIPANT RECRUITMENT AND SUPPORT

The Center for Coastal and Marine Ecosystems (NOAA CCME) student recruitment plan accommodates entry from associate degree programs at community colleges to doctoral programs at partner institutions. Students will be recruited into a predetermined suite of coastal and marine ecosystem fields. Resources provided through this cooperative agreement will be leveraged with resources at each of the partnering institutions. Relationships exist between NOAA CCME lead and partner institutions and numerous community colleges (CCs) with large minority student recruiting pools. Working with CC counselors, we will identify and recruit STEM and social science transfer students with a desire to work on topics in coastal and marine ecosystems, economies and communities. The NOAA CCME will utilize allocated and leveraged funds to support students during their tenure at community colleges as well as incoming freshman undergraduate students. Partner institutions have staff onsite at community colleges to facilitate awareness of NOAA CCME academic programs for a smooth transition to undergraduate studies. The undergraduate student recruitment strategy includes the transition of students from community colleges and scientific conferences. Undergraduates students are typically recruited as rising sophomores with preference for students who participate in freshman research experiences offered at each of the NOAA CCME partner institutions supporting undergraduates (NOAA CCME FAMU, CSUMB, JSU, and UTRGV).

Outstanding undergraduate students will be strongly encouraged to pursue post-baccalaureate educational opportunities at institutions noted for excellence in the NOAA related sciences. However, a key component of the NOAA CCME graduate student

recruitment strategy includes providing a pipeline for students from partnering institutions that do not offer Ph.D. programs. Graduate students will also be actively recruited at national and international meetings, and particularly at meetings targeting underrepresented communities. Examples of these meetings include:

- Society for Advancement of Chicanos/Hispanics and Native Americans in Science Conferences (SACNAS) (NOAA CCME partner TAMUCC is a gold-level sponsor; Dr. Garza, NOAA CCME CSUMB, serves on the Board of Directors).
- Association for the Sciences of Limnology and Oceanography Meetings (ASLO) (including Ocean Sciences).
- National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE)
- Coastal and Estuarine Research Federation (CERF) meetings.

These societies maintain list-serves, websites and a social media presence. The NOAA CCME will use these mechanisms to disseminate graduate fellowship opportunities. In addition, the Center will utilize the American Association for the Advancement of Science (AAAS) Minority Scientists Network for recruitment.

The NOAA CCME will utilize cross-center cohort building strategies for retention and progression through graduation. In addition to Individualized Student Development Plans (ISDP) and faculty mentoring, a student-run online community will be used to enhance student performance. Both FAMU and CSUMB have successful on campus LLCs. While it is not feasible for the Center to have a physical LLC due to the geographic distances between partner institutes, the Center will develop a virtual LLC (vLLC). Through the vLLC online Google group students will engage with each other, share their successes and failures, and assist each other to navigate career issues. It is envisioned that, just as in existing LLCs, the virtual LLC will enhance and support peer and near-peer instructions and tutoring. The cohort building will be reinforced in real life through interactions at the Center-Wide Core Competency Course, NOAA CCME meetings, the NOAA EPP Biennial Education and Science Forum, and on those occasions when students have a common NERTO.

The NOAA CCME will use Taskstream, a web-based learning and assessment management platform, to monitor and document student performance, and track post-graduation experiences in association with NOAA CCME goals and objectives. NOAA CCME staff will use the Taskstream portfolio assessment software system to track candidate, course, and programmatic progress and outcomes in adherence to NOAA guidelines.

Details on Student Cohorts

NOAA CCME year one and two cohorts will include a total of 12 Ph.D., 22 M.Sc., 17 first-time-in-college (FTIC) undergraduates, 7 community college students. Over the course of Years 2-5, 22 new M.Sc. students will be recruited and 7 new community college students to replace graduating students of Cohorts 1 and 2.

The level of annual student financial support has been internally verified for the Center. Each partner institution budgeted funds meet or exceed those delineated in the FFO NOAA-SEC-OED-2016-2004758 subsection 8.1.1. The student financial support aligns with the proposed recruitment plan, and it includes NERTO support for graduate students.

II. Enhance metrics

Based on the NOAA CCME Strategic Plan Performance Indicators and Educational Training Metrics as outlined in the NOAA CCME Evaluation Plan are as follows:

Performance Objective 1: Demonstrate expertise of faculty and students in areas of coastal environmental science and management.

Performance Indicators

1.1 Number of invited and/or reviewed/refereed presentations and publications by our NOAA CCME scientists

1.2 Number of faculty, underrepresented minority students, and affiliates trained in modern environmental methods, including geo-spatial approaches and other related technologies

Performance Objective 2: Demonstrate academic performance and placement of NOAA CCME supported students in various fields related to coastal environmental science and management.

Performance Indicators

2.1 Number of NOAA CCME sponsored student publications and presentations

2.2 Number of NOAA CCME sponsored students graduating from collaborating institutions

2.3 Number of students successfully matriculated into advanced degree programs

2.4 Number of NOAA CCME graduates entering into the workforce in NOAA and related science and management fields

2.5 Retention rate of students in NOAA CCME programs

Personnel Metrics

Performance Objective 1: Demonstrated research output of NOAA CCME faculty.

Performance Indicators

1.1 Number of publications (peer-reviewed, reports to state, national, federal, and non-federal entities) and presentations (scientific, agency, inter-agency, local)

1.2 Number and dollar value of external funding and in-kind support

Performance Objective 2: Demonstrate utility of NOAA CCME research models and tools to stakeholders.

Performance Indicators

2.1 Number of authorized users of database and products developed by the NOAA CCME

2.2 Number of website hits inquiring about spatial data layers for GIS and centralized server for data distribution

2.3 Number of metadata/data sets that are integrated into environmental intelligence and easily accessible among partners and stakeholders

Performance Objective 3: Demonstrated active participation of students in NOAA CCME research.

Performance Indicators

3.1 Number of students involved in research projects and output such as thesis and dissertations

Research Metrics

Performance Objective 1: Demonstrated increase in relationship and partnerships with external agencies.

Performance Indicators

1.1 Number of laboratories and centers (local, national, NOAA, federal and state facilities) in NOAA CCME collaborations

1.2 Number of co-authorships involving multi-disciplines and multiple institutions

1.3 Number of authorships with students as first authors

Performance Objective 2: Demonstrated grantsmanship by NOAA CCME faculty

Performance Indicators

2.1 Amount of leveraged funding

2.2 Number of proposals submitted and funded for additional leveraged funding to support NOAA CCME and NOAA related projects

Performance Objective 3: Demonstrated collaborations within the NOAA CCME and with external scientists.

Performance Indicators

3.1 Number of collaborations with NOAA and other partner scientists and personnel

3.2 Number of established cross-institution collaborations (including presentations and other collaborative work) including cross-center collaborations

Relationships/Partnerships Metrics

Performance Objective 1: Demonstrated enhancement in curriculum identified in the accepted award at partner institutions.

Performance Indicators

1.1 Number of new classes and course revisions within partner institutions relevant to the NOAA CCME mission

1.2 Number of students enrolled in NOAA CCME mission relevant courses at partner institutions

Education and Outreach Metrics

Performance Objective 1: Demonstrated increase of external educational and outreach activities Performance Indicators

1.1 Number of seminars, webinars, short courses, joint workshops, public forums, conferences and/or symposia organized by member institutions

1.2 Number/percentage of students completing core competency courses

1.3 Center wide activities in support of education, capacity building, and outreach to achieve outreach goals.

1.4 Number of students participating in first year experience for STEM majors course, summer camps, poster contests, and other education/outreach activities.

III. **Specific measures of success will be determined as indicated in the NOAA CCME Evaluation Plan as shown:**

Appendix Table 2 NOAA CCME Evaluation Measures

Key Performance Indicator	**NOAA CCME Goals**
Goal 1 - Recruit, train, and graduate underrepresented minority groups, with the competencies and skills that support NOAA's Education Strategic Plan workforce goals. Goal 1 is weighted at 30% of overall evaluation score.	
1. Number of NOAA CCME underrepresented minority undergraduate Scholars recruited into NOAA-mission related degree programs at partner institutions	1a
2. Number of NOAA CCME underrepresented minority graduate Scholars recruited into NOAA-mission related degree programs at partner institutions	1a
3. Number of total budgeted underrepresented minority Post Docs recruited into the NOAA CCME	1a
4. Number of total budgeted Post Docs recruited into the NOAA CCME	1a
5. Number of total NOAA CCME Scholars enrolled in NOAA CCME related disciplines/ programs and courses at partner institutions during reporting period	1a
Training	
6. Percentage of enrolled NOAA CCME Scholars receiving center wide core competency (CWCC) short course certification	1c
7. Percentage of total NOAA CCME Graduate Scholars who have participated in required experiential opportunities in NOAA mission-relevant sciences (NERTO, SSIO, etc.)	1d
8. Percentage of participants of the GIS Activity	3b
9. Percentage of NOAA CCME Scholars with the required GPA in NOAA related degree programs at partner institutions – at the end of reporting period	1a
10. Number of NOAA mission-aligned invited or refereed presentations or publications by NOAA CCME scientists	2b
11. Percentage of NOAA CCME Scholars applying to NOAA-sponsored internships	2d
Program Completion	

Key Performance Indicator	NOAA CCME Goals
12. Number of NOAA CCME underrepresented minority Scholars who graduate in NOAA-mission sciences annually	1a
13. Number of NOAA CCME Scholars who graduate in NOAA-mission sciences annually	1a
14. Number of NOAA CCME graduates who pursue post-graduate degrees in NOAA mission-aligned disciplines.	1a
15. Number of NOAA CCME Scholars accepted into postdoctoral level programs	1b
16. Number of NOAA CCME Scholars hired by NOAA, NOAA contractors, NOAA mission-aligned industries, and other natural resource and science agencies at the federal, state and local levels.	1a
Goal 2 - Conduct research leading to the development of management and communication tools that can be utilized to enhance the resilience of coastal communities and economies. Goal 2 is weighted at 20% of overall evaluation score.	
Research	
1. Percentage of NOAA CCME Graduate Scholars with approved research required quality rating on faculty-mentored research projects	2b
2. Number of research projects, theses, and dissertations that include human dimension components	2b
3. Number of NOAA scientists research mentors (NOAA/NERTO mentors)	1d
4. Number of total NOAA CCME scientists (faculty and scholars) establishing research collaborations with NOAA specialists and scientists	1d
5. Number of research collaborations with NOAA and other partner scientists and personnel	2a
6. Number of NOAA CCME faculty who published their research findings in peer-reviewed journals during reporting period	2b
7. Number of management and communication tools (models, datasets, etc.) developed in alignment to NOAA CCME sponsored research	3c
8. Number of citations referencing use of NOAA CCME developed tools	3c
9. Number of citations referencing NOAA CCME sponsored research or publications	2b
10. Total number of research projects conducted by NOAA CCME scientists (faculty and scholars)	2b

Key Performance Indicator	NOAA CCME Goals
Goal 3 - Develop competencies and skills in the utilization of new and existing "big data" archives in decision support tools that promote the vibrancy of coastal and marine ecosystems. Goal 3 is weighted at 20% of overall evaluation score.	
Big Data Competencies and Skills	
1. Percentage of student participating in the NOAA CCME Big Data Bootcamp	3a
2. Percentage of NOAA CCME Scholars demonstrating learning gains as a result of NOAA CCME training relative to the use of NOAA large data sets	3a
3. Number of NOAA CCME sponsored research projects that make use of NOAA large data sets	3b
4. Number of NOAA CCME Scholars who are trained to access and use NOAA data sets.	3c
Overall Impact is weighted at 30% of overall evaluation score.	
1. Number of NOAA CCME post-secondary Scholars from underrepresented communities who are trained and graduate in NOAA-mission sciences	1a
2. Number of NOAA CCME post-secondary Scholars who are trained and graduate in NOAA-mission fields relevant to this announcement.	1a
3. Number of NOAA CCME graduates who enter the NOAA mission workforce as hired by NOAA, NOAA contractors, NOAA partners, or resource management agencies, or academia or as entrepreneurs	1a
4. Number of NOAA CCME graduates who participate in and complete agency mission-related postdoctoral level programs	1a
5. Amount of funds leveraged with this NOAA EPP award (including post-secondary student support)	1a
Overall Evaluation Matrix Score *.30 x (Goal 1 Score) + .20 x (Goal 2 Score) + .20 x (Goal 3 Score) + .30 x (Overall Impact Score*	

IV. Could NOAA CCME Goals and Objectives also emphasize a plan to interface with the NOAA Partners (e.g. Cooperative Institutes: a distinct hiring pathway (non-Federal in nature) for the scientific expertise that NOAA directly depends on day-to-day)? and

V. NOAA CCME prepares students for employment in NOAA mission fields, there should additionally be a clear Objective with activities and measures that demonstrate the effort to get the NOAA CCME students into NOAA hiring pathway, and NOAA-related enterprises to meet the future workforce NOAA EPP goal.

NOAA CCME has included in measured goals and objectives the number of research partnerships developed with NOAA Partner scientists and personnel as well as the number of NOAA CCME students hired by NOAA, NOAA contractors, and other natural resource and science agencies at the federal, state and local levels. Professional development will include Federal and non-Federal workforce pathways. Students will also gain exposure to multiple pipelines to the NOAA mission workforce through participation in various scientific conferences and events.

VI. Highlight plan for NOAA CCME engagement with student training opportunities e.g., Sea Grant Fellowships, Presidential Management Fellowships, and the Pathways Program.

Faculty and Staff of NOAA CCME will provide professional development resources, one-on-one mentoring, and webinars to help students prepare for available student hiring opportunities and scholarships presented by NOAA. Additionally, each NOAA CCME partner institution will require NOAA CCME student engagement with available on-campus career development centers.

VII. The implementation plan requires specifics for the NOAA CCME <u>Rising Sophomore summer</u> <u>research experiential training</u>.

Summer research experiential training opportunities will be available to rising sophomore students center-wide. These experiences may include REU participation, field research, and lab training. In addition to these opportunities each NOAA CCME partner institution with NOAA CCME Undergraduate Scholars (FAMU, CSUMB, JSU, and UTRGV) will invite 5-10 STEM students at their institution to participate in an experiential training seminar in July 2017. Faculty and Education Leads at each institution will utilize resources provided by the NOAA CCME Assistant Director to provide information regarding the EPP/MSI and Ernest. F. Hollings Undergraduate Scholarship Programs. During the Rising Sophomore Summer seminar students will be led through the process of developing a competitive application. In the Fall 2017 student application materials will be reviewed by NOAA CCME Faculty to provide feedback prior to the final submission process.

VIII. Student training and professional development component could be enhanced with specifics that address how ideas will be implemented, e.g. Living Learning Communities, Center cohort community building, fostering or strengthening; mechanisms for students becoming engaged with the NOAA CCME programming components – with identified measures of success; etc.

Virtual community building success will be monitored based on individual student participation in bi-weekly video conferencing and use of the online Taskstream (graduate students) and Blackboard (all students) communities.

IX. NOAA CCME Administration and Management items:

- **Communication-Communication-Communication: Inward and outward facing**
- **Clear accountability, products, and timelines**
- **Communication/engagement plan within and across CSC, with identified frequency, content/mode with stakeholders, incl. with NOAA, private sector and others also include an annual Center wide calendar with key activities**

A Center-wide communication plan that takes advantage of a variety of media approaches and establishes frequencies for communications among the participating groups, including students, faculty, participating institutions, NOAA EPP/MSI and other NOAA Line offices has been developed. Monthly meetings for focal area groups, NOAA CCME PIs, and the Center Management team have been established. Student recruitment and individual progress is reported each month to the Education Expert during the Education call.

Each student is responsible for submitting a research synopsis to his or her advisor. After the advisor reviews the synopsis it is shared with the relevant focal area group and finally approved by the NOAA CCME Center Management team. At this stage the research synopsis is shared with the NOAA CCME NOAA Program managers for final approval.

NOAA CCME PIs serve as points of contact for the Center. External center communications must be vetted through the NOAA CCME Center Management Team.

The NOAA-NOAA CCME communication plan encompasses a variety of media approaches and establishes frequencies for communications among the participating groups including students and NOAA (EPP and NOS). *Table 2* shows an outline of the NOAA-NOAA CCME communication plan media utilized with stakeholders.

Appendix Table 3 NOAA CCME Communication Plan

Media	**Plan Stakeholders**								**Frequency**	**Responsibility**
	Students	Partner Institutions	NOAA (EPP & NOS) NOAA Leadership	University Administration	Policy Makers – National and State	NOAA-NOAA CCME Advisory Board	Public and NGO's	Other Stakeholders	Deliverables	
Website	X	X	X	X	X	X	X	X	Updated weekly;	NOAA CCME Communication /Data Manager
Facebook	X	X	X			X	X		Updated daily and/or weekly	Center Administration
Twitter	X	X								
List Serve	X	X			X				General: Daily and/or as necessary SSIO: weekly	NOAA CCME Administrative Assistant
Conference calling	X	X	X	X	X	X	X	X	NOAA-NOAA CCME Committee: Monthly NOAA-NOAA CCME (2nd Monday) Advisory Board: Quarterly NERR Coordinators: Monthly	Center Director

									Workgroup: Monthly (2nd Friday)	
Blackboard	X	X				X			Student and Faculty: Access granted within two (2) weeks of entering program	NOAA CCME Administrative Assistant
Webinars	X	X	X	X		X			Center: Bi-monthly NOS/NCCOS: Monthly and when available	NOAA CCME Administrative Assistant
Taskstream	X	X	X						NOAA-NOAA CCME Student and Faculty: Access granted within two (2) weeks of entering program Training: Bi-monthly	NOAA CCME Administrative Assistant, Education Lead, and Communication /Data Manager
National and Local Conferences	X	X	X	X	X	X	X	X	As suggested by NOAA-NOAA CCME Faculty	Center Administration, Partner Institution PI's, NOAA CCME faculty advisors
Email	X	X	X	X	X	X	X	X	Daily; as necessary	Center Administration
Videos/Flyers/ Brochures	X	X	X	X	X	X	X	X	Video: Produced Summer 2015	Center Administration

									Flyer/Brochure: Produce and release	
Letter of Understanding	X	X							Start of program/beginning of school year; Completed by NOAA-NOAA CCME students	Center Administration & Partner Institution PI's

1. Conference calls are facilitated by the Center Director
- NOAA CCME Center-wide PIs and NOAA-EPP, Technical Monitors – meets monthly
- NOAA CCME Advisory Board and Science Advisory Council – meet bi-annually
- Focal area meetings – held as needed and facilitated by the focal area leads

2. Taskstream training and assessment is facilitated by the Education Lead and Communication/Data Manager
- Training sessions – held bi-monthly

i. Faculty training, analysis, and recommendations
ii. Student training, analysis, and recommendations

3. Webinars are facilitated by the NOAA CCME Assistant Director, and Communication/Data Manager
- Partner institutions will provide student research findings and updates
- Graduate student and professional development webinars – held monthly Center-wide
- NOAA relevant webinars

4. Website development and implementation is facilitated by the Communication/Data Manager
- Newly restructured website – updated monthly and with ongoing weekly updates.

5. Blackboard is an online learning and collaboration platform – facilitated by Education Lead and Communication/Data Manager
- All students and Faculty Center-wide have access
- New students receive access within two (2) weeks of entering the program
- Use for Center-wide web conferencing – for webinars and training sessions

6. Professional conferences and workshop recommendations are suggested by the NOAA CCME faculty advisors.

7. Facebook and Twitter are updated by Center administration.
- Social media provides Center-wide collaboration and communication with students and among student groups.

8. List serve is facilitated by the NOAA CCME Assistant Director
- To disseminate career, scholarship, experiential and internship opportunities to students as well as other meeting, seminar, and information as directed by the Center Director via email.
- NOAA Office of Education, Student Scholarship Internship Opportunity (SSIO) – database is checked weekly by the NOAA CCME Assistant Director

9. Email is facilitated by the Center Director, faculty, and staff

- For general communication between partners as well as general information sharing with all stakeholders

10. Promotional Videos, Flyers, and Brochures will be developed and disseminated. These will be prepared to meet specified targeted audiences to include: University administration, state and federal legislators

- NOAA-NOAA CCME Director and Center-wide administration will be responsible for these promotional materials
- The video will be produced to recruit and promote the NOAA CCME

X. For Key Personnel – identify NOAA CCME framework for who at Center does the activities of key personnel while recruitment/hiring for vacant position is occurring.

The Data, Information and Communications Manager and Distinguished Research Scientist positions have been advertised and the closing date for receiving applications has been extended to July 21, 2017 to ensure a competitive candidate pool for both positions. This extension has now been approved through a recommendation from the Program Office.

At this time the Associate Director and Thematic Area Leads are assuming the responsibilities of the Distinguished Scientist. The Assistant Director, the Education Expert, and input provided by FAMU's IT staff are covering the essential functions of the Data, Information and Communication Manager.

XI. NOAA CCME must address clearly – meeting award requirements for Ethical Conduct of Research

Within the NOAA CCME a training video will be developed by the Lead Institution with input from NOAA CCME Partners to inform faculty and students of the Ethical Conduct of Research requirements as outlined in the FY16 FFO. NOAA CCME Faculty and Students will be required to view the video at the Center-Wide Core Competency course. The Ethical Conduct of Research Training Video will also be made available through the NOAA CCME Taskstream and Blackboard online communities and the NOAA CCME website as a reference. By utilizing this tool Faculty and Students will receive training in fostering a research atmosphere based on integrity and gain an understanding of their personal responsibilities to prevent and detect research misconduct.

XII. Award requires early engagement with NOAA: for Scientific Research – NOAA CCME must identify how early engagement with NOAA personnel in research projects will be planned and accomplished center-wide.

Various NOAA personnel will be invited to participate in the NOAA CCME Annual Meeting. Through this interaction NOAA CCME Faculty will have the opportunity to discuss areas of intersection between possible student research projects and ongoing NOAA research. This will provide connections throughout the center that can be utilized for the duration of the FY16 award.

Additionally, Center reviewed student research project synopses will be disseminated to the EPP/MSI Program Office and the NOAA CCME Technical Monitors for suggested areas of engagement with particular NOAA personnel. Ongoing communication between the Center, NOAA Federal Program Officers and Technical Monitors will ensure that NOAA personnel are engaged throughout the process of development for individual student plans.

XIII. NOAA CCME must identify how tracking research projects to completion will be accomplished.

Individual students will receive guidance at NOAA CCME partner institutions from their assigned NOAA CCME PI. At the Center level the Education Expert will manage student tracking information using the online tool Taskstream. The use of Taskstream will allow for step-by-step tracking of student project synopses as they are reviewed by NOAA CCME PIs, Focal Area committee members, and the Center Management Team.

Appendix VII: Focal Area Student Competencies

Appendix Table 4: Focal Area Student Competencies

Coastal Resilience	*Coastal Intelligence*	*Place-Based Conservation*
1. The natural and nature-based infrastructure that address the impact of extreme weather on coastal ecosystems and communities.	1. The elements of sea-level rise observation networks and their relationship to sea-level rise projections.	1. The policies and commonly-used decision-making tools that support place-based conservation.
2. The community-based approaches for the preservation, fortification, and enhancement of natural and nature-based coastal infrastructure.	2. The leading stressors on ecosystem processes and their relationship to ecosystem health.	2. The relationship between natural, applied, and social sciences and the policies as it pertains to capacity management.
3. The models for community-based approaches for assessing the vulnerabilities and value of proposed solutions relating to the impact of extreme weather and sea-level rise on coastal ecosystems and communities.	3. Archived, existing, and new data streams that support ecosystems dynamics and research.	3. Best practices for engaging community stakeholders in addressing specific site-based concerns.
4. The tools used to study natural and nature-based infrastructure that mitigate the impact of extreme weather and sea-level rise on coastal communities and ecosystems.	4. Widely-used databases and decision-support tools that address coastal hazards.	4. Broadly-used ecosystems valuation tools and their use in place-based conservation efforts.
5. Integrating models and practices and other decision-making tools for ecosystem-based management.	5. Best practices for ecosystem assessment and restoration.	5. The tools used to balance conservation with demand for coastal resource utilization and economic development.
6. Advocating for the accountability of social science in planning and budgeting to enhance coastal community projects.	6. Demonstrate the use of communication approaches to deliver more effective warnings about coastal resources and coastal hazards.	6. Understand socio-economic data needs
_	7. Evaluate a select suite of products and services to confirm the integration and effective use of social science into coastal intelligence research.	7. Engage community stakeholders

Partnership Expertise and Degree Offerings

Florida Agricultural and Mechanical University (FAMU) is an 1890 HBCU land-grant institution, founded in 1887. FAMU is part of the State University System of Florida and includes satellite campuses in Orlando (law) and Miami, Jacksonville, Crestview and Tampa (pharmacy). Guided by the motto, *"Excellence with Caring"*, FAMU is dedicated to the advancement of knowledge, the resolution of complex issues and the empowerment of citizens and communities. The main campus occupies 156 buildings on 422 acres in Tallahassee, FL. FAMU enrolls approximately 10,000 students, including international students from more than 70 countries. The university offers 54 bachelors and 29 master's degree programs, 3 professional degrees, and 12 doctoral degrees: chemical engineering; civil engineering; electrical engineering; mechanical engineering; industrial engineering; biomedical engineering; physics; pharmaceutical sciences; educational leadership; and environmental science. The university has a growing research focal, with extramural funding approximately $50 million per year.

The NOAA CCME will be headquartered at FAMU in the Frederick S. Humphries Science and Research Center (FSH-SRC). Other FAMU colleges that will participate in the NOAA CCME include the College of Law, the College of Agriculture and Food Sciences, College of Science and Technology, the College of Social Sciences, Arts and Humanities, and the FAMU-FSU College of Engineering. The latter is a joint program with Florida State University, established in 1982. Together, these colleges include about 319 faculty and enroll over 3,300 students as a pool from which NOAA CCME faculty can access for program participants.

Each partner institution has a suite of NOAA-relevant degree programs. Each of these programs exceed the minimum 24 credit hours of STEM, socioeconomic and policy courses as specified by NOAA.

The following is a listing of NOAA CCME-related degrees offered by FAMU:

- B.S. in Biology, Chemistry, Computer Science, Engineering, Environmental Science, and Environmental Studies
- M.S. in Applied Social Science, Biology, Chemistry, Engineering, and Environmental Science
- Ph.D. in Engineering and Environmental Science

Bethune-Cookman University (B-CU) is a private HBCU that was founded by Dr. Mary McLeod Bethune in 1904. The University's mission is to serve in the Christian tradition the diverse educational, social, and cultural needs of its students and to develop in them the desire and capacity for continuous intellectual and professional growth, leadership and service to others. In addition to a long and impressive history of building servant leaders, B-CU has

distinguished itself by providing a value-building, faith-based culture, a vibrant social community, international educational partnerships, and a $46M endowment. The current enrollment is over 4,000 students, with the student body being about 59% female and 41% male.

The following is a listing of NOAA CCME-related degrees offered by B-CU:

- B.S. in Biology, Chemistry, Computer Information Science, Computer Science, Computer Engineering, and Integrated Environmental Science
- M.S. in Integrated Environmental Science and Public Health

California State University, Monterey Bay (CSUMB) is a young and growing Hispanic Serving Institution (HSI) with an academic mission to provide students, especially those from disadvantaged backgrounds, with the knowledge and skills to build meaningful and successful lives. CSUMB's Marine Science degree (430 declared majors) is the first of its kind in the 23 campus California State University (CSU) system and one of a few in the nation. In addition to a Marine Science degree, CSUMB also offers a Master's degree in Applied Marine and Watershed Science. Since its inception in 2007, the program has graduated 32 thesis students and 82 Professional Science Master's (PSM) students. Approximately 50% of those graduates are now in Federal and State agencies with 6 graduates having been awarded positions as California Sea Grant State Fellows.

Since 2014 CSUMB has administered an NSF Ocean Science REU. This is the first and only NSF Ocean Science REU in the CSU system. The program is structured as a distributed model REU within which students can conduct summer research at CSUMB, Elkhorn Slough National Estuarine Research Reserve, Hopkins Marine Station of Stanford University, Moss Landing Marine Labs, Monterey Bay Aquarium Research Institute and the Naval Postgraduate School. The diversity of institutions offers a number of NOAA related research experiences for students in areas such as Marine Biology/Ecology, Oceanography and Ocean Engineering. The program has supported 22 students with 60% of those students coming from groups historically underrepresented in Ocean Science. Three REU graduates have gone onto Ocean Science doctoral programs and two have gone onto Master's Programs. Through the CSUMB Ocean Science REU, undergraduate students at the partner campuses as well as at the broader national level will have the opportunity to conduct summer research with center researchers. Each year, selected faculty projects within the center will be listed as research opportunities for students. Students will be selected through a competitive process and provided with summer funding through the REU program. The REU program will markedly enhance the capacity of the proposed center to impact undergraduate student training.

The following is a listing of NOAA CCME-related degrees offered by CSUMB:

- B.S. in Marine Science, Biology, and Environmental Science, Technology and Policy
- M.S. in Marine Science and Environmental Science

Jackson State University (JSU), a Carnegie classified "high research activity" university, is the fourth largest publicly-supported educational institution in Mississippi. The University is seventh largest of the 105 HBCUs in the United States and is composed of seven academic units including the College of Science, Engineering and Technology (CSET). Accredited by the Southern Association of Colleges and Schools, the University offers 38 bachelor's degree programs, 38 master's degree programs, 9 specialist degree programs and 9 doctoral programs. JSU is the sole institution in the state of Mississippi offering a PhD degree in Environmental Science. Started in 1994, it has so far graduated 51 students, and currently has an enrollment of 30 doctoral students. Student training and cutting-edge research are being implemented in several centers currently operating within the College; the Research Centers in Minority Institutions' Center for Environmental Health, the Center of Excellence for the Study of Natural Disasters, Coastal Infrastructure and Emergency Management, and the Trent Lott Geospatial and Visualization Research Center (TLGVRC). JSU/CSET has been an active partner of the FAMU led Environment Cooperative Science Center (NOAA CCME) since its inception.

The following is a listing of NOAA CCME-related degrees offered by JSU:

- B.S. in Chemistry and Biology with concentrations in Marine Science and Environmental Science
- M.S. in Biology, Chemistry, Hazardous Materials Management, and Environmental Science
- Ph.D. in Environmental Science

Texas A&M University-Corpus Christi (TAMU-CC) is an expanding, doctoral-granting institution located on an island in Corpus Christi Bay, adjacent to the Gulf of Mexico. As a Hispanic Serving Institution (HSI), it is one of nine universities in the Texas A&M University System. With over 11,000 students from 48 states and 67 foreign countries, TAMU-CC has five colleges of academic studies. In addition to these five colleges TAMU-CC also houses the Harte Research Institute for Gulf of Mexico Studies (HRI). The mission of HRI is to support and advance the long-term sustainable use and conservation of the Gulf of Mexico by performing interdisciplinary research and translating this information to decision-makers. As a research center of excellence, the HRI vision is to provide international leadership in generating and disseminating knowledge about the Gulf of Mexico ecosystem and its critical role in the economies of the North American region. One of the hallmarks of HRI is that it operates as a tri-national institute, working with all three countries surrounding the Gulf of Mexico (US, Mexico, and Cuba). The HRI has six endowed chairs that form the basis of the research program and

oversee six focal areas: socioeconomics, biodiversity and conservation science, ecosystem studies and modeling, coastal and marine geospatial sciences/services, fisheries and ocean health, coastal and marine policy and law. Five of these six endowed chairs are collaborators on the NOAA CCME proposal and will be directly involved in helping to coordinate NOAA CCME student training and research. TAMU-CC/HRI has been an active partner of the FAMU led Environment Cooperative Science Center (ECSC) for the past 10 years.

All the degrees listed below train students in NOAA related sciences, and we have researchers in all the MS and PhD categories. HRI has various stem-related education-outreach programs that have been very successful in reaching large numbers of teachers and students in underrepresented and underserved middle and secondary schools in the Corpus Christi area. Gail Sutton and Jay Tarkington are the education-outreach specialists in charge of the program.

The following is a listing of NOAA CCME-related degrees offered by TAMU-CC:

- B.S. in Biology, Geology, Chemistry, Geographic Information Systems (GIS), Geospatial Systems Engineering, Environmental Science, Economics, and Atmospheric Science
- M.S. in Coastal and Marine System Science, Marine Biology, Biology, Chemistry, Environmental Science, and Fisheries and Mariculture
- Ph.D. in Coastal and Marine System Science, Marine Biology, and Geospatial Computer Science

The University of Texas-Rio Grande Valley (UTRGV) is a Hispanic-serving institution with total enrollment of ~ 30,000 majority Hispanic students (97%) making it the second largest Hispanic Serving Institution in the U.S. UTRGV was established by the UT System Board of Regents to serve and stimulate the growing population and economic needs of the Lower Rio Grande Valley, South Texas, and the state. We anticipate that UTRGV will very soon be the top producer of Hispanic college graduates in the nation in many disciplines, particularly science and engineering. UTRGV has committed itself to the study of marine and coastal environments having 1) created a new academic unit, School of Earth, Environmental, and Marine Sciences with 22 faculty members including expertise in environmental policy, resource valuation, and resiliency; 2) launched a new bachelor's degree in Marine Biology (Spring 2015); 3) a new MS in Marine, Coastal and Watershed Sciences (Fall 2016); 4) submitted for planning authority for a joint Ph.D. in Marine Environmental Sciences with the University of Texas Marine Science Institute for Fall 2017; and 5) purchased 8.5 acres in Port Isabel as the site for a future South Texas Coastal Research Center and Ocean Observatory in addition to their existing 12,780 sq. ft. Coastal Studies Laboratory on South Padre Island. UTRGV is also one of the nine institutional members of the Texas One Gulf Consortium Center of Excellence (RESTORE-COE).

The following is a listing of NOAA CCME-related degrees offered by UTRGV:

- B.S. in Marine Biology, Biology, Chemistry, and Environmental Science
- M.S. in Ocean, Coastal, and Earth Science, Biology, Chemistry, and Agricultural Environmental, and Sustainability Sciences
- M.A. in Disaster Studies