NOAA CENTER FOR COASTAL AND MARINE ECOSYSTEMS (CCME)

Semi-Annual Performance Report for
Award Number NA16SEC4810009
Reporting Period: September 1, 2017 to February 28, 2018

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NOAA Cooperative Science Center Project Performance Report

I. Executive Summary

This report covers the accomplishments for the reporting period September 1, 2017 – February 28, 2018, for the National Oceanic and Atmospheric Administration's Center for Coastal and Marine Ecosystems (NOAA CCME). The CCME is a cooperative agreement between the NOAA Educational Partnership Program for Minority Serving Institutions (EPP/MSI), Florida A&M University (FAMU) – Lead, with Partners: 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-Rio Grande Valley (UT-RGV).

The mission of the CCME is to build upon the best practices from the previously established NOAA Environmental Cooperative Science Center (ECSC) and educate and train a new generation of scientists, particularly from underrepresented minority communities, in NOAA-relevant STEM disciplines and social sciences, equipped to utilize interdisciplinary approaches to address issues confronting marine and coastal communities.

During this reporting period, NOAA CCME directly supported a total of 54 students, across two cohorts, pursuing postsecondary degrees (8=Doctoral; 20=Master's; 22=Baccalaureate; 4-Transfers). CCME faculty and staff have successfully recruited 1 undergraduate student, 2 Transfer undergraduate students, 3 Master's students, and 2 Doctoral students. **The CCME uses a front-loading approach to satisfy the award requirement for 50 percent direct student support. CCME students' recruitment and support to meet the award requirements cover two funding years. CCME projected in the Implementation Plan to have students 58 (12 PhD; 22 MS/A; 17 B; 7CC Transfers) over two years; with recruitment again in Year 3. In the next reporting period, the CCME Implementation plan goal for student recruitment will be exceeded.**

CCME congratulates its first graduate, **Mr. Philip Bellamy**, MS in Integrated Environmental Science (J. Cho, CCME-BCU faculty advisor). Two CCME Master's Fellows completed their NERTOs: (i) Shun G's (MS - CCME-BCU) completed his internship, *Investigating causes of changing tidal range and timing in U.S. harbors* with NOS-CO-OPS (NOAA Mentors: C. Zervas, G. Dusek, C. Roche.); (ii) Philip Bellamy (MS - CCME-BCU) completed his internship, *Investigating land-use impacts on eutrophication in Biscayne Bay* with OAR-AOML (NOAA Mentor: C. Kelble).

Four CCME Scholars successfully competed to participate in 2018 training opportunities with the NOAA Ship Okeanos Explorer: Rebekah Hernandez (MS, CCME-UTRGV Fellow), Miya Pavlock-McAuliffe (MS, CCME-UTRGV Fellow), Prian Vidal (MS, CCME-FAMU), and Harrison Watson (UG, CCME-JSU). CCME Scholar, Prian Vidal (MS, CCME-FAMU), was also selected for a slot with the Gulf of Maine Harmful Algal Bloom Cyst Cruise (after traveling to ME, a weather event prevented the cruise from sailing).

Research synopses for CCME scholars were forwarded to get EPP Program's assistance in recruiting NOAA mentors. EPP provided feedback for revisions to research synopses. In this reporting period, research synopses related NOAA contacts included – OAR GLERL (EPP), NMFS Office of Habitat Conservation (EPP), National Water Center (EPP for all CSCs and esp. CCME-TAMUCC Fellow), and NMFS SEFSC (EPP with CCME).

Through center-wide monthly conference calls and frequent engagement of faculty via focus group discussions that help align student research, continued success in this arena is assured. NOAA Program Office and Technical Monitors are on the CCME Monthly Calls exchanging information

NOAA CCME Team members also met with the NOAA EPP Program Managers, NOAA Grants Management Division representatives, and the award Technical Monitors through in-person and virtual meetings on October 16-17, 2017. During this NOAA EPP Monitoring Visit the NOAA CCME Team shared current progress towards award objectives, and strategies towards meeting future objectives. The CCME team also worked closely with our external evaluator on the evaluation plans for the second year.

NOAA CCME prepared for extensive participation in the NOAA EPP/MSI 9th Biennial Education and Science Forum with approximately 20 Faculty/Administration and 40 students, both CSC-supported and travel scholarship recipients from all NOAA CCME academic institutions.

Table A: CCME Cohort Numbers

Summarized Student Information. CCME Cohort Numbers that reflect the reduced NOAA funding - actual versus planned cohort recruits.

	FAMU	**BCU**	**CSUMB**	**JSU**	**TAMUCC**	**UTRGV**	**TOTAL Actual**	IMPL PLAN
PhD	2	-	-	1	5	-	**8**	12
MS/A	4	5	3	1	1	6	**20**	22
BS/BA	9	-	3	5	-	5	**22**	17
Transfer	1	-	-	3	-	-	**4**	7
TOTAL	**16**	**5**	**6**	**10**	**6**	**11**	**54**	58

NERTO for 26 CCME students (18=M; 8=D)
Completed NERTOs (2=M)
Planned: Approved SSIO project for 1 CCME-FAMU MS student, Rosa Marin (May 2019 - 2019)
NOAA Mentor: C. Woodley

2018 NERTOs: Calendar year 2018 = 22
Summer 2018: 2 planned

- CCME Scholar Taylor Eddy – CCME CSUMB = synopsis to be shared for review by Center Management Team;

CCME Scholar Nigel Lascelles – CCME FAMU = working with Ashok Deshpande to develop Summer 2018 NERTO

II. Accomplishments

1. Major Activities:

Engagement with NOAA

NOAA Monitoring Visit October 16-17, 2017

NOAA CCME Faculty, staff, and students from all CCME partner institutions met virtually and in-person with NOAA EPP Program administration, Technical Monitors, and Grants Management Division representatives, and the NOAA CCME External Evaluator to review current progress in the FY16 award. This engagement was an opportunity for NOAA staff and the External Evaluator to assess award progress in terms of recruitment, and student research and training activities at the CCME partner institutions.

National Water Center Visit October 26-27, 2017

Center Director Dr. Larry Robinson travelled to Tuscaloosa, AL to increase potential collaboration opportunities for student training. Dr. Robinson shared information regarding current student research and explore potential student training opportunities and collaboration with National Water Center scientists.

Recruitment

Recruitment activities took place at conferences whose missions are to enhance involvement in STEM disciplines amongst minority populations. These activities offered opportunities to disseminate information related to NOAA CCME activities and research to target audiences for the FY16 award.

SACNAS Meeting October 18-21, 2017

One NOAA CCME Scholar and one faculty member traveled to the SACNAS meeting. NOAA CCME Faculty Member Dr. Corey Garza has been elected as a member of the SACNAS Board from January 2018.
http://sacnas.org/2017/12/06/sacnas-elects-new-board-members-to-take-office-january-2018/

National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) October 30 – November 3, 2017

Associate and Assistant Directors Dr. Michael Abazinge and Dr. Sharmini Pitter traveled to Minneapolis, MN to participate in a student recruitment event to recruit graduate students to NOAA CCME.

2. Specific Objectives:

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.

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

Direct student support for this reporting period was provided through financial support in the amount of $714,189 as detailed in Section VII, Table 12, to CCME fellows for graduate student tuition, stipends, conference and research-related travel, and research-related supplies.

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

Tallahassee Science Festival October 28, 2017

CCME Assistant Director Dr. Sharmini Pitter attended the Tallahassee Science Festival along with several CCME Scholars to provide a hands-on activity to upper-level high school and community college students in the Tallahassee area. This was also an opportunity to meet with key STEM leaders from the Tallahassee Community College (TCC) faculty and staff to encourage them to share potential transfer students with NOAA CCME for future recruitment and to take advantage of the existing articulation agreement between TCC and the NOAA CCME Lead Institution. This activity provided opportunities to recruit transfer students to NOAA CCME, and to enhance awareness of NOAA CCME and build local relationships within the community.

1c) *Utilize the Center-Wide Competency Course (CWCC) to ensure student proficiency in CCME focus areas.*

No CWCC took place during the current reporting period. However, planning of future student competencies for each focal area were developed and shared with the NOAA CCME External Evaluator. Further development of and strategies towards student achievement these competencies and will be reported in the next reporting period.

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.*

CCME management and Co-PIs circulated Student Scholarship Internship Opportunity (SSIO) and other opportunities to CCME fellows and encouraged them to identify NOAA mentors and develop their NOAA Experiential and Research Training Opportunities (NERTO). CCME and EPP worked together to find appropriate NOAA mentors and NERTOs for graduate CCME Scholars as they completed the Center review process for their project synopses (See Table 11).

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.

2a) *Assess coastal risks and vulnerabilities*

In collaboration with their faculty advisors, and in some cases their NOAA mentors, CCME students further developed research project ideas that will explore coastal challenges. Examples include:

- The impacts of policy governing freshwater inflows and resulting management practices on coastal user groups
- The impact of sea-level rise on coastal marshes and communities
- The causes and implications of water quality degradation, including hypoxia, in South Texas bays and estuaries
- Erosions of marsh shoreline and other impacts of barge traffic to critical bird habitat and shellfish

2b) *Identify solutions to reduce risks and vulnerability*

The student research projects seek to identify the following solutions:

- Recommendations for policy and regulation improvements to protect freshwater inflows
- Coastal and marine protection program recommendations that incorporate economic impact analysis and ecosystem services valuation
- Maps and models with cross-system applicability to inform mitigation/conservation management
- Ways to reduce the impacts of barge traffic to critical bird habitat and shellfish

2c) *Utilize engagement to empower coastal communities.*

Several student project synopses now include a component of coastal community engagement as part of project execution. These plans will be further developed with the assistance of NOAA CCME Faculty advisors and NOAA Mentors.

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.

3a) *Develop and implement a "Big Data Analytics Boot Camp".*

The Big Data Analytics Boot Camp was not scheduled for the current reporting period. During the current period NOAA CCME Faculty shared Big Data resources with students and planned future Big Data activities.

3b) *Conduct research utilizing "Big Data" sets related to coastal and marine ecosystems.*

Coastal Intelligence Projects will utilize large data sets related to coastal and marine ecosystems. Students in this focal area have been encouraged to explore incorporating existing NOAA data sets and/or contributing to existing public data sets as part of their research projects.

3c) *Develop tools such as communication and mitigation strategies associated with threats to coastal and marine ecosystems and coastal communities.*

As part of developing student research plans several students have identified engagement with coastal communities through surveys and meetings. Further details will be available in future reporting periods as the students execute their research plans.

3. Significant Results:

CCME staff and PIs continue to work extremely hard to operate the Center for Coastal and Marine Ecosystems in an effective manner. Planning for the Year 2 Annual Meeting to meet the requirement to host the meeting at a NOAA facility began with NOAA in November – during this reporting period. The planning was included as part of the Monthly calls and has been extensive involving all CCME partners and with NOAA's input throughout the process. Significant facilitation for venues and logistics involved Technical Monitor Chris Moses (for OAR AOML) and EPP Program Office's Jacqueline Rousseau and NMFS SEFSC Trika Gerard (for NMFS SEFSC).

CCME plans to use the Second Annual Meeting at AOML as an occasion to expand and explore collaboration with NOAA scientists and staff from the NOAA Line Offices located in such proximity at this meeting site: AOML and SEFSC.

Progress in the Focal Areas with review and approval of research synopses. Review and revisions have been enhanced with increased understanding of required elements such as aligning and linking to NOAA's mission and who might be the users of the information/data generated from the research. CCME anticipates that additional NERTO internships will be initiated and completed in the next reporting period. CCME faculty have had on-gong engagement with NOAA on a personal level and these are being strengthened. Additional CCME faculty are engaging with NMFS (SEFSC and NEFSC).

4. Key outcomes or other achievements:

Training and Professional Development: All NOAA CCME Scholars participated in completing their Individual Student Development assessment with the help of NOAA CCME Faculty and staff in January 2018. This assessment tool will be used to track student progress through key professional development activities including interview skills, resume development, grant writing and many more as outlined in the Implementation Plan.

Graduate NOAA CCME Scholars presented their project synopses to the various Focal Areas and submitted the approved draft to the Center Management Team and EPP for further review. Several students are now actively seeking NOAA mentors as outlined in Table 11.

NOAA CCME Areas of Focus

Integrating Social Science into NOAA's Mission:

Critical to the effective use of science generated from and about our natural systems, is the impact that it can have on human systems. Training the next generation of NOAA scientists (natural and social) will require a multidisciplinary approach. Resource managers and stakeholders should better understand the linkages between what is taking place in their natural environment and how it impacts their community and individual well-being; to prepare for the NOAA workforce, CCME students must learn how to study, understand, and communicate those linkages.

The National Ocean Service Priorities Roadmap explicitly recognizes this need by connecting the bio-physical sciences in *Coastal Resilience, Coastal Intelligence, and Place-Based Conservation* with human dimensions. To successfully support the NOS Roadmap, and more importantly, to bring about lasting change in how scientists do business, a top priority for the NOAA CCME is to train students with a multidisciplinary approach in mind from the beginning, coupled with experiential learning opportunities in the communities where we conduct our scientific research.

This integrated approach also supports NOAA's *Social Science Vision and Strategy* as well as priorities within the *Strategic Research Guidance Memorandum*.

NOAA CCME Social Science Integration Strategy:

The Social Science Committee continues to work with CCME faculty and students to incorporate social science themes within the focal areas of Coastal Resilience, Coastal Intelligence, and Place-based Conservation. Each focal area team has a representative on the social science team, who participates in the monthly teleconferences. The team continues to work to identify key strategies to incorporate social science into each thematic area across the CCME.

Every NOAA CCME graduate student is required to present their research proposal synopsis to the relevant research Focal Area team. During this process a representative of the Social Science Committee is also present to provide input regarding the incorporation of human dimensions or social science techniques to each project. The student project synopses are then reviewed by the Center Management Team and shared with NOAA EPP personnel to receive further input to ensure NOAA mission-aligned research. Further, CCME graduate student thesis and dissertation research projects must either incorporate some aspect of social sciences or address the larger human dimensions impacts of the project, but this does not mean all CCME students must conduct social science research. For example, a student researching the benthos or coral reefs need not incorporate an economic analysis. The students' graduate committees will make the final decision on the human dimensions of their research and students will explain the social science/human dimensions features/importance of their project in the proposal synopsis they submit to CCME.

In addition, the learning objectives from the 2017 CWCC have been adopted as the CCME social science core competencies. These are listed below:

- Students will be able to define Social Science and understand its role in coastal and marine science and management.
- Students will become familiar with key Social Science methods, including the Participatory Action Research (PAR) Model, and discuss how to integrate them into their research projects.
- Students will learn how data-gathering and analysis are utilized for social science and its application in design and implementation of research projects.

This committee explored additional strategies for student development and measurement of these competencies. Current strategies include:

- CCME Social Science/Human Dimension (SS/HD) modules online and at the CWCC with faculty interaction and pre/post-testing

- Degree programs and coursework that students complete, cross checking them to assess student exposure to SS/HD core competencies
- Social Science Committee participation in student research proposal development to ensure integration of SS/HD into each proposal synopsis.

Another activity during this reporting period focused on the CCME Social Science Committee's engagement with the NOAA Social Science Committee. Hence, social science leads from each of the centers (CSCs) are invited to participate in the NOAA Social Science Committee calls but are not required to participate beyond the invitations. The social science briefing to this committee will take place on the first Wednesday of each month. The CSCs will rotate to provide a 12-15 minute briefing on social science integration within their center. On November 9, 2017, Dr. Grasso shared the NOAA Social Science Committee's three main Priorities via a teleconference with the Centers' social science leads. During the November 15, 2017 call, an overview of Howard University's Center's social science research was presented.

NOAA's Social Science Committee encouraged Centers' social science committees to continue communication with them to develop relationships with NOAA social scientists as Centers develop their methods and needs. For example, on November 8, 2017, there was a teleconference among Drs. Mary Culver, Pitter and Gray-Ray to determine how social science may be applied in real life settings. Dr. Culver (Office for Coastal Management in Charleston, SC) shared several resources during and after the call. Additionally, the NOAA Social Science Committee provided documents outlining their objectives and strategies under three main Priorities and asked that CCME activities be aligned. Strategies provided pertain to assessing and communicating the value of NOAA products and services. The CCME Social Science Committee is currently working on strategies to accomplish the NOAA committee's request. As a follow-up, Drs. Yoskowitz and McLaughlin met to assess the Priorities documents as well as the NOAA Social Science Vision and Strategy (SSVS). The SSVS expresses NOAA social science goals more broadly and may provide more opportunity for CCME project alignment than do the NOAA committee's objectives and strategies for their priorities, which seem clearly geared to operationalizing the SSVS within NOAA and its line offices.

Dr. Phyllis Gray-Ray, CCME's Social Science Lead, participated in a teleconference with other Centers' social science leads (Valerie Were, CUNY and Terrie Adams-Fuller, Howard

University) on February 27, 2018, to discuss ways to collaborate on strategies to integrate social sciences into their respective centers. They shared useful information on strategies, challenges, and agreed to have a monthly teleconference beginning in April, 2018. Progress made towards CSC social science integration as a result of these meetings will be included in future reporting.

Coastal Intelligence Summary:

As of the current reporting period, CI has a total of 14 CCME Scholars (two Ph.D, six M.Sc. and six Bachelors pursuing students, Tables 1 and 2) who are being mentored. In total CI has received, reviewed and approved five (two. Ph.D. and three M.Sc.) student proposal synopses (Table 2). CI faculty members also serve as advisors and supervise student projects submitted to other focal areas in the realms of Place-Based Conservation and Coastal Resilience as many of the student projects cross-cut the focal areas. This past period, one Master's student defended and graduated and is employed in a NOAA relevant field at the National Geospatial-Intelligence Agency.

Table 1: CI Focal area CCME Scholars: Graduate students.

Student	**Degree, Institution** **Project Title**	**CCME Advisor(s)** **NOAA Mentor**
Lily Walker*	Ph.D. student, TAMUCC Dissolved oxygen dynamics in Texas estuaries	Wetz; Suzanne Bricker
Patricia Cockett*	Ph.D. student, TAMUCC Investigating Anthropogenic Impacts on Coastal Marine Systems: The Ahupua'a Concept	Montagna; Randall Kosaki
Phillip Bellamy* (Graduated)	M.Sc. student, BCU A GIS Approach for Determining the Potential Runoff Coefficient and Runoff Depth for the Mosquito Lagoon, FL.	Cho; Chris Kelble
Shan Guruvadoo*	M.Sc. student, BCU Investigating causes of changing tidal range and timing in U.S. harbors	Cho; Greg Dusek; Chris Zervas
Angelique Rosa-Marin*	M.Sc. student, FAMU Implementation of the FORAM Index (FI) in coral reefs from Jobos Bay at Puerto Rico	Martinez-Colon Long; Cheryl Woodley

Prian Vidal	M.Sc. student, FAMU Nitrogen sequestration associated with oyster aquaculture in the Oyster Bay, Aquaculture Use Zone, Wakulla Co, FL	Jagoe, Johnson; Suzanne Bricker
Brianna Alanis	M.Sc. student, UTRGV Using primary productivity proxies as ecosystem health metrics	Breier
Stanley Ra'Teema	M.Sc. student, FAMU Predict Florida Tourism Trend via Data Analytics Techniques	Chi Long

* Student with proposal synopses development plan approved.

Table 2: CI Focal area CCME Scholars: Undergraduate students.

Student	**Degree, Institution Project Title**	**CCME Advisor(s)**
Olivia Boisen	B.Sc. student, CSUMB Effects of Ionic Strength on Carbonate Equilibria	Goeltz
Emily Chui	B.Sc. student, CSUMB Patterns of mussel recruitment in Monterey, Bay	Haupt
Melissa Meredith	B.Sc. student, CSUMB Effects of climate change induced ocean acidification and hypoxia on reproduction of rockfishes	Logan
Alexis Hamilton	B.Sc. student, FAMU Impact of Pharmaceuticals and Personal Care Products (PPCPS) on Eustrine Microbes and their Ecosystem Service	Long
Shaquila Rolle	B.Sc. student, FAMU Impact of Pharmaceuticals and Personal Care Products (PPCPS) on Eustrine Microbes and their Ecosystem Service	Long
Javier Garcia	B. Eng UTRGV Using deep learning computer vision techniques to better manage ocean sensing data storage and transmission needs	Breier

The Coastal Intelligence (CI) Focal Area consists of faculty members (21 regular members) with diverse backgrounds (Table 3). Many members sit on other focal area committees and to help ensure cross-center interaction and integration of goals. In addition, graduate students have presented their project synopses during the monthly meetings. Lastly, EPP and NOS representatives have been invited and participated in meetings. The manner of participation framework is still to be developed. The CI focal area developed and approved the Year 2 CI goals and strategies and continues to refine CI student competencies with input from the CCME External Evaluator.

Table 3: Coastal Intelligence focal area committee members

Institution	Faculty Name
FAMU	Richard Long (Focal Area, co-Lead)
	Michael Abazinge
	Hongmei Chi (Big Data Lead)
	Clayton Clark
	Phyllis Gray-Ray (Social Science Lead)
	Charles Jagoe
	Elijah Johnson
	Wenrui Huang
	Bernadette Kelley (Education Lead)
	Michael Martinez-Colon
B-CU	Hyun Jung ("J.") Cho (PBC, co-Lead)
CSUMB	Corey Garza (PBC, co-Lead)
	John Goeltz
	Alison Haupt
	Cheryl Logan
JSU	Ranjani Kulawardhana
	Timothy Turner
TAMUCC	Paul Montagna (Focal Area, co-Lead)
	James Gibeaut
	Mikell Smith
	Mike Wetz
UTRGV	John “Chip” Breier
	Leticia Contreras

What Coastal Intelligence proposed:

The following is the list of specific objectives over the 5 funding years.

- Improve sea level rise impact projections by enhancing the SLR observation network
- Improve understanding of ecosystem health through investigations focused on the influence of stressors on ecosystem processes
- Improve understanding of ecosystem dynamics through using archived, existing, and new data streams
- Develop database and decision support tools to address coastal hazards
- Identify/develop best practices for ecosystem restoration and assessment

Report of Year 2 CCME CI Goals:

Target Goals for Year 2

- Incorporate Coastal Intelligence research and classroom activities to increase student engagement and understanding of coastal intelligence and its tools.
- Have each partner institution identify, reach out to, and engage with at least one key stakeholder for their current resource use practices and demands, and needs in Coastal Intelligence.
- Increase student competency in scientific communication, outreach and stakeholder engagement.
- Engage Stakeholder Advisory members in our monthly conference calls,
- Increase the number of student presentations during the calls.
- Increase student exposure to technological tools for coastal intelligence.
- Expand student concept of coastal intelligence to include socioeconomic networks.

Expected CCME CI Student Competencies

- The elements of observation networks and their relationship to monitoring and assessment of global issues, e.g., climate change, sea-level rise, landscape-seascape-habitat change, hydrological alteration, fisheries impacts, water and sediment quality
- The leading stressors on ecosystem processes and their relationship to ecosystem health
- Archived, existing, and new data streams that support ecosystems dynamics and research
- Widely-used databases and decision-support tools that address coastal hazards

- Best practices for ecosystem assessment
- Best practices for ecosystem restoration
- The use of models and monitoring in ecosystem-based management

Strategies to achieve the Year 2 Objectives

- Document and make an inventory of CI research and classroom activities (e.g. capstone courses) which can be leveraged to increase student engagement and understanding of coastal intelligence including tools and technology employed for assessment.
- CCME CI should hold a series of online workshops and seminars on topics relevant to the areas of competency desired. Incorporate relevant OneNOAA Science Seminars.
- Develop student learning outcomes and assessment tools for the competencies with input from the CCME External Evaluator.
- Work with collaborative NOAA scientists, NOS Roadmap, input from NOAA technical monitors, the Community Stakeholders Advisory Board, and the NOAA CCME Advisory Council.

Progress and expectations

CCME CI faculty and students have been engaged in research centered on the employment of interdisciplinary approaches to further their objectives related to marine and coastal ecosystem characterization in response to stressors, modeling and tool development with the context of relevant human dimensions.

Accomplishments this reporting period:

1. Status of Activities:
    a. CI focal area of 23 faculty members meets monthly on the 3rd Monday of the month at 4 PM eastern.
        - Graduate students are presenting in the meetings
        - NOAA EPP and NOS personnel are participating in the meetings
    b. CI Focal Area has developed, reviewed, and approved the Year 2 CI goals and strategies.
        - A subcommittee is developing an implementation plan including student learning outcomes and assessment for competencies.
2. Student synopses submitted to and approved by CI
    a. 2 Ph.D.
    b. 5 M.Sc.

3. Postdoctoral Development Plan submitted to and approved by CI

a. Not applicable at this time.

4. Leveraged Research/Training Activities

a. Walker, L. Led undergraduates on a 24hr. sampling event and taught them methods for plankton sampling and identification (annual marine ecology diurnal) 2/16/2018:
b. Walker, L.: Coastal Conservation Association Banquet - put the event together as a CCA board member. 2/22/2018
c. Cockett, P worked on her detailed research proposal (for TAMUCC), and she is collaborating on a project with Dr. Ruby Mehrubeoglu (TAMUCC Engineering) using a 3D scanner to look for differences in oyster shell morphology among Texas estuaries.
d. CCME students at B-CU had opportunities to network with regional scientists and managers at the Indian River Lagoon Symposium which had 350 participants from institutions and organization who are involved in the estuarine research (Feb 8-9, 2018).
e. Long RA. Organization committee for the First Annual Florida Marine Science Symposium hosted by Florida Institution of Oceanography. Oct 25, 2017.
f. Montagna, P.A and Chi, H.E Organizing a special session at the summer 2018 ASLO meeting.

g. Montagna, P.A. (lead) Benthic Invertebrate Taxonomy, Metagenomics, and Bioinformatics (BITMaB) Workshop" in Corpus Christi, TX 15-19 January 2018.
h. Montagna, P.A. participated in the 4th workshop on the "Central Role of the Mississippi River in the Gulf of Mexico" at Tulane University. This is part of a NOAA-funded RESTORE ACT project. 9-10 January 2018
i. Long RA. and Martinez-Colon, M. serve on an external SEACAR Indicators Review Team for the Florida Department of Environmental Protection' NOAA sponsored Statewide Ecosystem Assessment of Coastal and Aquatic Resources (SEACAR).

5. Current/new leveraging grants/Projects for CCME students related to CI

a. RAPID: Capturing the Signature of Hurricane Harvey on Texas Coastal Lagoons. National Science Foundation #1760006, $182,790, 10/01/2017 09/30/- 2018, (CCME TAMUCC)

b. Developing a set of recommendations and implementation strategy for management of environmental flows delivered to upper Rincon Bayou by the Rincon Bayou Pipeline, Coastal Bend Bays & Estuaries Program #1817, 09/01/2017 - 8/31/2019, $30,000, (CCME TAMUCC)

c. Modeling and Decision Support Tools for Management of Nutrients in the Gulf of Mexico, National Oceanic and Atmospheric Administration via subcontract from Gulf Coastal Oceanic Observing System, 09/01/2017 - 8/31/2019, $50,000, (CCME TAMUCC)

d. Estuaries and Coasts, Editor in Chief, Coastal and Estuarine Research Federation, 01/01/2018 - 12/31/2018, $10,000, (CCME TAMUCC)

e. Breier. Establishing a harmful algal bloom and plankton community composition observing time-series in the Lower Laguna Madre at Brazos Santiago Pass. Texas Parks & Wildlife Department. $279,537. 2 years. (CCME UTRGV)

f. Breier. Systematic Underwater Biogeochemical Science and Exploration Analog. NASA. $233,875, and ROV time provided by NOAA OET. (CCME UTRGV)

Newly Submitted/Pending Proposals

a. Benthic foraminifera and their microbiomes: characterization of heavy metal resistant bacteria. NSF HBCU-UP Research Initiation Award. $287,885. 8/1/2018-8/1/2020 (CCME FAMU)

b. It takes two to tango: benthic foraminifera and their microbiomes in oxic/anoxic estuaries. NSF HBCU-UP Research in Excellence Award. $497,005, 8/1/2018-8/1/2021(CCME FAMU)

c. Elucidating the community trophic structure of three cave systems across the Floridan aquifer using environmental DNA and next generation DNA sequencing. NSF HBCU-UP Research in Excellence. $499,954 9/1/2018-8/31/2021(CCME FAMU)

d. Collaborative Research: Detecting Vulnerabilities in Cyber-Physical Systems with Artificial Intelligence. NSF HBCU-UP Research in Excellence. $255,955. 1/1/2019-12/31/2021(CCME FAMU)

e. Estuarine Turbulent Mixing and Responses to Multiple and Extreme Forcing. NSF HBCU-UP Research in Excellence. $500,000. 9/1/2018-8/31/2021(CCME FAMU)

Place-based Conservation Summary:

Thus far, PBC received, reviewed, and approved eight (two Ph.D. and six M.S.) student proposal synopses and one postdoctoral research plan (Table 4). The Place-Based Conservation (PBC) Focal Area consists of faculty members (21 regular members) with diverse backgrounds, working closely with other thematic areas (Table 5). PBC faculty members serve as advisors and supervise student projects submitted to other focal areas in the realms of Coastal Intelligence and Coastal Resilience as many of the student projects cross-cut the focal areas. Since PBC programs work to enhance community benefits and increase the value experienced by local and indigenous populations, PBC along with the Coastal Resilience representative team continue to invite NOAA CCME Stakeholder Advisory Board members to monthly conference calls as their roles will be essential in developing outreach strategies and means, and survey questions. Jace Tunnell, Director of Mission Aransas National Estuarine Research Reserve, participated in the February 2018 PBC conference call. During this reporting period, PBC Focal Area developed, reviewed, and approved the Year 2 PBC goals and strategies as well as the PBC student competencies. PBC also developed and distributed a checklist of student competencies for partnering institutions and their degree programs' inputs.

Table 4: Submitted PBC Focal area student synopses and postdoctoral development plan

Student	**Degree, Institution**	**Synopsis Title**	**CCME Advisor(s) NOAA Mentor**
Diana Del Angel	Ph.D., TAMUCC	Assessment of Salt Marsh Ecosystem Services in the US Gulf of Mexico	David Yoskowitz; Rebecca Allee; Mary Culver
Taylor Eddy	M.S., CSUMB	Multiscale habitat drivers of MPA Performance	Corey Garza
Lauren Parker	M.S., CSUMB	The ecology of organisms on the "lost reefs" of the MBNMS: diver-held video surveys from 20-40 m water depth	James Lindholm

Elizabeth Del Rosario	Ph.D., TAMU-CC	Environmental Flows Management Strategy for the Coastal Zone in Texas	Richard McLaughlin
Anthony Lima	M.S., UTRGV	Understanding Inter-Agency Cooperation, Politics, and Management of the Gulf of Mexico Fishery	Owen Temby
Javier Rene Navarro	M.S., UTRGV	Analysis of the facilitative interaction between the herbaceous halophyte Batis maritima and establishing seedlings of *Avicennia germinans*	Alejandro Fierro-Cabo
Ashley Elizabeth Murphy	M.S., UTRGV	Tracking nitrogen transfer through Black Mangrove community	Carlos E. Cintra-Buenrostro
Meghan Martinez	M.S., TAMUCC	Influence of oyster reef restoration on estuarine nekton and infauna	Jennifer Pollack
Erin Easton	Postdoc		David Hicks

Table 5: Place-based Conservation focal area committee members

Institution	**Faculty Name**
CCME FAMU	Bernadette Kelley
	Charles Jagoe
	Michael Abazinge
	Phyllis Gray-Ray
	Richard Long
CCME TAMUCC	David Yoskowitz
	Greg Stunz
	Mikell Smith
	Richard Mclaughlin
	Paul Montagna
CCME UTRGV	Alejandro Fierro Cabo
	Carlos Cintra
	David Hicks
	Erin Easton
	Leticia Contreras
CCME JSU	Brent Thoma
	Timothy Turner
	Ranjani Kulawardhana
CCME CSUMB	Corey Garza
CCME B-CU	Hyun Jung ("J.") Cho

What PBC proposed: Develop place-based knowledge and comprehensive ecosystem service assessment tools that improve "Coastal Intelligence" and enhance "Coastal Resilience"; Work with stakeholders and communities to put these tools into action; and Train the next generation of environmental professionals is a key part of our strategy. Particularly, our education, research, and outreach goals are designed to strengthen coastal resilience through involvement of local community in planning, developing, implementing, and evaluating ecosystem service assessment tools.

The following is the list of specific objectives over the 5 funding years.

1. Develop outreach, policy, and decision-making tools
2. Link natural and applied science, social sciences, and policy-making to increase management capacity
3. Engage and involve local communities for balanced conservation that addresses demands for coastal resource use and economic development
4. Enhance community engagement by emphasizing the unique opportunities and issues connected with special places of concern
5. Provide comprehensive ecosystem service valuation tools and place-based knowledge
6. Develop and implement ecosystem service assessment tools that balance conservation with the demands for coastal resource utilization and economic development

Report of Year 2 CCME PBC Goals:

Target Goals for Year 2

- Leverage CCME institutions' current classroom activities and collaboration to increase student engagement and understanding of place-based conservation and coastal resilience
- Document ecosystem services (ES) for the habitats that we currently work with
- Identify and reach out to key stakeholders at the special places for their current resource use practices and demands, economic development challenges and needs, and conservation plans/practices with the help of social science approaches (Invite state Sea Grant extension coordinators and/or Stakeholder Advisory Board members to conference calls)
- Help develop at least five (5) student research projects that are relevant to NOAA NOS and PBC and Coastal Resilience (Target the current CCME undergraduate students)

Strategies to achieve the Year 2 Objectives and Recruitment

- Document and make an inventory of PBC/CR research and classroom activities (e.g. capstone courses) which can be leveraged to increase student engagement and understanding of place-based conservation and coastal resilience. (Appendix A)
- Compile a list of habitats that people are working with in their geographic areas then Coastal Resilience team would come up with a list of ES provided by the habitats (e.g., ecosystem services known to be provided by intertidal rocky shoreline, salt marsh, seagrass, oyster reefs). Obtain those biophysical features we are working with to make a list of ES. Reach out to Sea Grant extension offices; and invite each state's Sea Grant representative(s) to our regular conference calls. Bring the stakeholder advisory committee in; a quarterly call to invite them or the stakeholders join the PBC/CR conference call one at a time so we can hear more about the regional issues. Provide updates to individual stakeholder regarding projects. Co-PIs should document the engagement with those folks and report on it. Send those items to Mike Smith so he can keep track. (Invite state Sea Grant extension coordinators and/or Stakeholder Advisory Board members to conference calls)
- Work with collaborative NOAA scientists, NOS Roadmap, input from NOAA technical monitors, the Community Stakeholders Advisory Board, and the NOAA CCME Advisory Council

Progress and expectations

PBC has begun to compile a list of habitats that CCME faculty/students are working with in their geographic areas. The Coastal Resilience Community of Practice (CRCP) team will develop a list of ecosystem services (ES) provided by the habitats (e.g., ecosystem services known to be provided by intertidal rocky shoreline, salt marsh, seagrass, oyster reefs). PBC will then identify the biophysical features we are working with to make a list of ES. PBC and CRCP faculty members plan to reach out to their Sea Grant extension offices; and invite each state's Sea Grant representative(s) to our regular conference calls and also bring the stakeholder advisory committee in; a quarterly call to invite them or the stakeholders to join the PBC/CRCP conference call one at a time so we can hear more about the regional issues.

Accomplishments this reporting period:

Since PBC programs work to enhance community benefits and increase the value experienced by local and indigenous populations, PBC along with a Coastal Resilience representative team continue to invite NOAA CCME Stakeholder Advisory Board members to monthly conference

calls as their roles will be essential in developing outreach strategies and means, and survey questions. Jace Tunnell, Director of Mission Aransas National Estuarine Research Reserve, was invited to participate in the February 2018 PBC conference call. During this reporting period, PBC Focal Area developed, reviewed, and approved the Year 2 PBC goals and strategies as well as the PBC student competencies. PBC also developed and distributed a checklist of student competencies for partnering institutions and their degree programs' inputs.

6. Status of Activities:

a. The focal area consists of 21 regular members from the six institutions. PBC meets once a month (Table 3).

b. PBC along with a Coastal Resilience representative team continue to invite NOAA CCME Stakeholder Advisory Board members to monthly conference calls as their roles will be essential in developing outreach strategies and means, and survey questions.

- Jace Tunnell, Director of Mission Aransas National Estuarine Research Reserve, was invited to participate in the February 2018 PBC conference call
- During the February 26th combined conference call for Place-based Conservation, CRCP, and Social Science Committee members heard a detailed and informative presentation from CCME Stakeholder Advisory Board member Jace Tunnell, Director of the Mission Aransas National Estuarine Research Reserve located in Port Aransas, Texas. He provided an overview of the NERR's territory and operations, which intersect with various local partners and communities. Following his brief presentation, CRCP members were able to query Mr. Tunnell about his perception of the research priorities for his region based on local community issues and needs. Below is his list with some key points:
    - Freshwater inflows: they conduct research looking at abundance of fish, shrimp and crab with relation to freshwater inflows.

- Mangrove encroachment: Whooping cranes avoid black mangroves so how they affect them moving forward is a management consideration.
- Sea level rise (as at any NERR): How will it affect species and how to adapt.
- Oyster aquaculture: Agencies are looking at what should be allowed, so research on this subject and on the oyster fishery would be helpful.
- Endangered shore bird species: Red knots, piping plover, snowy plover, and Wilson plover utilize NERR lands so shoreline management is an issue.
- Sea turtles: The NERR hosts the Animal Resources Keep, which conducts nesting patrols to conserve populations and deals with turtle strandings; they have 40 years of data.
- Impact of hurricanes
- Water quality: as it effects habitats and humans
- Marine debris accumulation study: looking at accumulation rates at specific sites, separate into categories, and identify turtle bites.

The committee will determine how best to share this information with students to identify potential research ideas and partnership opportunities. The information may also be useful as the CRCP works to recruit new students.

c. PBC Focal Area developed, reviewed, and approved the Year 2 PBC goals and strategies.
d. PBC developed and distributed a checklist of student competencies for partnering institutions and their degree programs' inputs (Appendix A)
e. Identified the special places for independent research and community outreach: and compiled a list of habitats that people are working with in their geographic areas so that Coastal Resilience team would come up with a list of Environmental

Services (ES) provided by the habitats (e.g., ecosystem services known to be provided by intertidal rocky shoreline, salt marsh, seagrass, oyster reefs).

7. Student synopses submitted to and approved by PBC

a. 2 Ph.D. and 6 M.S. research synopses

b. See Table 4 for the list

8. Postdoctoral Development Plan submitted to and approved by PBC

a. One postdoctoral development plan (Table 4)

9. Leveraged Research/Training Activities

a. CCME students at B-CU had opportunities to network with regional scientists and managers at the Indian River Lagoon Symposium which had 350 participants from institutions and organization who are involved in the estuarine research (Feb 8-9, 2018).

b. Rio Grande Valley Coastal Expo (Feb 6 and 9): Rebekah Hernandez, Elizabeth Murphy, and Anthony Lima volunteering

c. All CCME students at B-CU are required to take a GIS course and conduct a term project using GIS software.

d. Collaboration with local governments, communities, and other stakeholders present CCME students with hands-on experiences in involved in Coastal Resilience and Place-based Conservation activities and processed involved.

e. 58th annual Regional Science Fair: Leticia Contreras of UTRGV

f. CCME students at B-CU visited the NOAA's Southeast Regional Office for the National Marine Fisheries Service on March 13, 2018 and met with the Deputy Director Andy Strelcheck and tour the facility. The students also met with the Division Chiefs from the Operations, Sustainable Fisheries, Protected Resources, and Habitat Conservation Divisions.

10. Current/new leveraging grants/Projects for CCME students related to PBC

a. D.W. Hicks (UTRGV), Commercial Launch Site Species Monitoring Survey (Construction Phase: 2017-2018); SpaceX

b. The South Texas Banks Ecosystem: Oceanography, Biodiversity and Genetics. Texas Sea Grant Program, 2015-2017. $179,027. Diego Figueroa and David Hicks (UTRGV). Includes collaborative works with The Flower Garden Banks

National Marine Sanctuary and NOAA's Deep Sea Coral Research and Technology Program's Southeast Deep Coral Initiative (SEDCI). Includes CI related activities such as multibeam bathymetry, multibeam fisheries assessments, water quality, and ROV surveys of fish and invertebrate populations.

c. Mesophotic Reef Anchoring Impact Study. NOAA CRCP Funding. David Hicks. To begin in 2018
d. Reed Canal Basin Stormwater Improvement through Treatment Wetland Construction in South Daytona, FL, Indian River Lagoon National Estuary Program. $181,148. 10/1/2017-09/30/2019 (B-CU)
e. Implementing and evaluating the effectiveness of native vegetative buffers at controlling nonpoint source pollution and as a tool for public education along the Indian River Lagoon, FL Department of Environmental Protection and EPA. $494,693. (B-CU)
f. Tree Fund for Stormwater Improvement through Treatment Wetland Construction in South Daytona, FL, Volusia County, $20,000, 11/20/2017-05/30/2018 (B-CU)
g. Wetland plant grant from Volusia County. Volusia County, $5,000, 3/1/2018 – 8/1/2018 (B-CU)
h. Estimating absolute abundance of Red Snapper in the Gulf of Mexico, Sea Grant/NOAA/USM, $9,500,000, 9/1/2017, Greg Stunz (TAMUCC).
i. NFWF-Connecting Youth to Coastal Habitat Restoration in Texas, National Fish & Wildlife Foundation, $249,293, Jennifer Pollack, (TAMUCC).

Newly Submitted Pending Proposals

- Habitat Restoration for Coastal Resilience within the Halifax River Estuary, FL $818,994, National Oceanic and Atmospheric Administration. (Preproposal submitted) (B-CU)
- Implementing and Evaluating Living-Shorelines as Controls for Nonpoint-Source Pollution National Academies of Sciences: Gulf Research Program. $46,500. (B-CU)
- Sediment study of the long-term history of IRL seagrass beds and investigation of Wigeongrass as a restoration species. Indian River Lagoon National Estuary Program. (B-CU)

- Improvement of Coastal Littoral Zone Imaging Using Hyperspectral Data. Department of Defense. $600,000, Jun 2018 – May 2021 (B-CU)

Coastal Resilience Community of Practice (CRCP) Summary:

During the reporting period a total of three CCME Scholars are associated with this focal area (Table 6). The CRCP approved her proposal. The group will work to find two additional students for this focal area over the remainder of this fiscal year.

The CCME Coastal Resilience Community of Practice (CRCP) consists of nine CCME faculty members (Table 7) who meet monthly to advance the CCME Coastal Resilience objectives and to discuss student research proposals. CRCP discussions and activities remained closely linked to the Social Science Committee (SSC) and other focal area committees as members continued to serve on multiple committees, fostering cross-group communication, cross-pollination of approaches, and familiarity with CCME research.

Table 6: Coastal Resilience student proposal synopses presented and approved by the CRCP

Student	**Degree, Institution, Project Title**	**CCME Advisor**
Mallory Brooks	M.S. student, BCU	Hyun Jung ("J.") Cho
	Evaluating the effectiveness of restored shorelines in mitigating non-point source pollution and climate impacts in the Mosquito Lagoon, Florida, USA.	
Cristina Madrid	M.A. student, UTRGV	Owen Temby
	Local Disaster Coordination in the Rio Grande Valley	
Samuel Mwenda	M.S. student, BCU	Hyun Jung ("J.") Cho

Table 7: Coastal Resilience focal area committee members

Institution	Faculty Name	Other Committees
BCU	Hyun Jung ("J.") Cho	PBC, CI, EDU, SS
FAMU	Hongmei Chi	CI, SS
	Phyllis Gray-Ray	PBC, CI, EDU, SS
	Elijah Johnson	CI, SS
	Bernadette Kelley	PBC, CI, EDU, SS
TAMU-CC	Richard McLaughlin	PBC, EDU, SS
	David Yoskowitz	PBC, EDU, SS
	Mikell Smith	PBC, CI, EDU, SS
UT-RGV	Owen Temby	SS

During October of 2017, the CRCP and Place-based Conservation (PBC) Focal Area teams combined into one meeting, although the two focal areas were preserved as subgroups within it. This was done to alleviate capacity deficiencies within the CRCP that were placing undue burden on members. Starting in November, the groups began meeting together via web conference. Since the SSC consists of the same persons as the CRCP, the web meetings are scheduled for a two-hour period with PBC and CR in the first hour and SSC following. Due to scheduling conflicts, there was no CRCP agenda for the December meeting, scheduled for the 18th, which consisted solely of three research proposal presentations by three students working in the PBC focal area. Now that capacity challenges have been addressed, the CRCP is again making good progress toward its goals. A small group met offline on December 14th to develop a strawman set of strategies for students to achieve coastal resilience core competencies and to attain CRCP Year 2 goals.

The CRCP drafted and discussed a set of strategies for ensuring students acquire the Coastal Resilience Core Competencies. CRCP participants reviewed the plan during January and adopted the list of CCME CRCP student competencies and strategies on the February call, noting that the committee will discuss and refine them on an ongoing basis as the need arises with further input from the CCME External Evaluator.

CCME Coastal Resilience Core Competencies and Strategies

What CRCP Proposed:

- Apply knowledge of natural and nature-based infrastructure to address issues of extreme weather events
- Engage in community-based approaches for implementation of natural and nature-based infrastructure
- Create a model for a community-based approach to assessing needs and implementing solutions for mitigation of impact from extreme events and sea level rise using natural and nature-based infrastructure
- Develop tools for the assessment of natural and nature-based infrastructure in a selected variety of coastal ecosystem and communities for mitigation of impact of extreme events and sea level rise

Report of Year 2 CCME CRCP Goals:

Target Goals for Year 2

1. Recruit at least three more students to CRCP
    a. Identify the available CCME student positions at each partner institution.
    b. Work with those faculty members to recruit students into this focal area.
2. Encourage CCME faculty to integrate Coastal Resilience (CR) concepts into coursework.
    a. Develop the CR focal area core competencies and provide them to CCME faculty.
    b. CCME faculty may offer relevant guest lectures in person or via webinar to other faculty to expose their classes to CR concepts, methods, and competencies.
3. Engage with Coastal Resilience Priority Issue Team (CRT) of the Gulf of Mexico Alliance to share research output and work with communities.
    a. Encourage students to join the CRT so they will receive team communications, including information about CR projects, tools, and research needs for the Gulf.
    b. Ask CCME PIs to allow CR focal area students to attend CRT meetings, if and as funding allows.

4. Integrate students more fully into the CRCP calls and associated activities.
    a. Invite CR students to present their research projects on CRCP calls.
    b. Develop the CR focal area core competencies and share them with CCME faculty, encouraging them to share with their students.

Expected CCME CRCP Student Competencies

CCME students will demonstrate knowledge and understanding of:

1. The natural and nature-based infrastructure that address the impact of extreme weather on coastal ecosystems and communities.
2. The community-based approaches for the preservation, fortification, and enhancement of natural and nature-based coastal infrastructure.
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.
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.

Strategies for Students to Acquire CR Core Competencies

1. CCME education and training activities will expose students to the CR core competencies, which are based on the CR focal area objectives from the award proposal.
2. Students will be exposed to the core competencies through the coursework they complete in fulfillment of their degree requirements.
    a. Students will enroll in and fulfill requirements of degree programs identified in the CCME award, which were evaluated for their alignment with NOAA science priorities when the proposal was written and accepted.
    b. Each university will re-evaluate its course offerings for relevance to CR student competencies, identify the core competencies addressed in each

course, and encourage participating students to take those courses within the constraints and guidance of existing degree programs.

c. PIs for each institution will monitor completion of coursework for their CCME students and their progress toward achieving exposure to the core competencies.

3. Students will participate in the CWCC and online materials made available on the CCME Blackboard and be exposed to the core competencies through those learning activities.
    a. Socio-economic and policy sciences are an important feature of implementing coastal resilience strategies. Achieving student competencies in these subject areas should take place through student completion of CWCC materials posted on the FAMU blackboard, and through student enrollment in relevant course offerings at each university.
    b. CCME faculty will interact with students via the CWCC online modules and provide evaluation and feedback of student responses.
    c. The CCME Education Expert will determine which students have completed the modules and report that information to CCME PIs and the CCME External Evaluator.

4. CCME universities should study the feasibility of sharing on-line courses and other educational resources that may enhance and supplement the CR-related course offerings at each institution.

5. CR competencies will be enhanced through thoughtful and coordinated experiential activities such as the 12-week NERTO experience, student research activities, professional conferences, community education and outreach efforts, and other extracurricular activities.
    a. Students will report these activities to the PIs for each institution who will monitor student progress toward achieving exposure to the core competencies.

6. Students will be encouraged to monitor and participate in the webinar-based OneNOAA Science Seminar Series (https://www.nodc.noaa.gov/seminars/).
    a. Students will report these activities to the PIs for each institution who will monitor student progress toward achieving exposure to the core competencies.

Students will be introduced to concepts through the blend of education and training activities outlined above. The CRCP is comparing the learning outcomes from the courses they take with the core competencies, using the course syllabi. If students pass the course with an A or B they will have accomplished the competencies covered in the course. NERTO, webinars, workshops, presentations, the CWCC, and student research will also be evaluated for the competencies to ensure students are developing the competencies through meaningful exposure. Using a template shared by Dr. Cho, the CRCP is populating a Competencies and Curriculum Tracking Matrix with all the courses required for the degree programs by institution and the competencies each course fulfills is noted. Each CCME institution can complete a tracking matrix and use that as a guide to monitor the competencies achieved as coursework is completed. The other CCME training activities should be evaluated for the competencies and listed on the matrix for the same purpose.

During this first six months of Year 2 of this award, the CRCP drafted a plan laying out goals for the fiscal year and strategies for achieving them. Discussion points in developing the plan included opportunities to recruit internally within and among our own institutions, to integrate coastal resilience into institutional coursework via guest lectures across disciplines, to expose students to what federal and state agency personnel are doing through involvement in Gulf of Mexico Alliance meetings and teams, and to have students present on their work during CRCP meetings and, as their work progresses, more broadly via CCME and NOAA webinar platforms.

Accomplishments this reporting period:

1. Status of Activities

   a. The CRCP consists of nine faculty members who participate in monthly conference calls, as do Dr. Pitter, CCME Assistant Director, and Dr. Howse, External Evaluator.
   b. CRCP members also sit on other focal area committees and the Social Science and Education committees to facilitate collaboration across the Center for an integrated education and research strategy.

2. To date, the CRCP has received and approved three student research proposal synopses for the Coastal Resilience focal area and adopted one other.
   a. Mallory Brooks, Master's Student, Bethune-Cookman University, "Evaluating the effectiveness of restored shorelines in mitigating non-point source pollution and climate impacts in the Mosquito Lagoon, Florida, USA," Advisor: Hung Jung (J.) Cho (approved)
   b. Cristina Madrid, Master's Student, UTRGV, "Local Disaster Coordination in the Rio Grande Valley", Advisor: Owen Temby (approved)
   c. Samuel Mwenda, Master's Students, Bethune-Cookman University, "Assessing Treatment Wetland Efficacy and Public Education in Stormwater Treatment Utilizing Native Plants", Advisor: Hung Jung (J.) Cho (approved)
   d. Diana Del Angel, Ph.D. student, TAMUCC, "Assessment of Salt Marsh Ecosystem Services in the US Gulf of Mexico", Advisor: David Yoskowitz (dual focus approved by PBC)
3. TAMUCC has one additional student slated to join CCME during the next reporting period and that student will likely work within the CRCP focal area.
4. New leveraging grants/Projects for CCME students related to PBC
   a. Dr. Yoskowitz was selected for a Gulf of Mexico Alliance (GOMA) Gulf Star award. "Incorporating Socio-Economic and Ecosystem Service Indicators into the Coastal Community Resilience Index" will be funded in the amount of approximately $68,000. The project is a collaboration between TAMU-CC, MS-AL Sea Grant, and the GOMA Habitat and Water Resources Priority Issue Teams.

b. Management Strategies for the Rincon Bayou Pipeline. Funded by the Coastal Bend Bays & Estuaries Program, Grant #1817, 09-01/2017 – 01/31/2019, $30,000, Paul Montagna, P.I.

5. The CRCP developed core competencies and strategies for ensuring and tracking student exposure to them.
6. The CRCP developed Year 2 goals and strategies.

III. Products of Award

Degrees Awarded: 1 M.Sc., Philip Bellamy, CCME Bethune-Cookman University, Advisor J. Cho. Philip has accepted a position at the National Geospatial-Intelligence Agency.

Student Publications in Journals: No student publications have been published during the current reporting period.

Faculty Publications in Journals:

a. Biber, P. and Cho, H.J. (Ed.). 2017. Special issue Coastal Seagrass and Submerged Aquatic Vegetation Habitats in the Gulf of Mexico. Southeast Geographer 57(3).
b. Brockmeyer, R., J. Beal, B. Sharpe, M. Hedgepeth, J. Tucker, H.J. Cho, C. Powell, K. Radabaugh 2017. Chapter 12. Indian River Lagoon (In) Coastal Habitats Integrated Mapping and Monitoring Program (CHIMMP) Report for the State of Florida. Radabaugh, K.R., C. Powell, R.P Moyer (Eds). Florida Fish and Wildlife Conservation Commission (FWC) publication, 134-143. Fish and Wildlife Research Institute, St. Petersburg, FL. Pp 160.
c. Cho, H.J., P. Biber, K. Darnell, K. Dunton. 2017. Seasonal and Annual Dynamics in Seagrass Beds of the Grand Bay National Estuarine Research Reserve, Mississippi. Southeastern Geographer 57(3): 246-272.
d. Dix, N., A. Small, R. Brockmeyer, H.J. Cho, S. Allen, K. Radabaugh. 2017. H. Radabaugh, K.R., C. Powell, R.P Moyer (Eds). Florida Fish and Wildlife Conservation Commission (FWC) publication, p 144-154. Fish and Wildlife Research Institute, St. Petersburg, FL. Pp 160.

Editor of Special Journal Issues
Books: No publications in this category during reporting period.
Book Chapters: No publications in this category during reporting period.

Thesis/Dissertations:
Faculty Conference Papers, Posters and Presentations:

a. Breier, Jakuba, Saito, Dick, Gomez-Ibanez, Tradd, Grim, Mcilvin, Chmiel, Alanis, Noble, Kellog, Garcia, "Clio: a vertical sampling AUV for next-generation ocean sectional studies." Ocean Sciences, 2018.

b. Brooks, Mallory, Adeljean L. Ho, and Hyun J. Cho. 2018. Evaluating the Effectiveness of Living Shorelines in Mitigating Non-point source Pollution and Increasing Soil Carbon Storage in the Mosquito Lagoon Watershed. Indian River Lagoon Symposium 2018, Feb 8-9. 2018, Harbor Branch Oceanographic Institute at Florida Atlantic University

c. Cho, H.J. 2018. Living Shorelines and Wetland Restoration using Florida Native Plants for Stormwater Runoff Management. 2/15/2018. Halifax-Flagler Sierra Club meeting.

d. Cho, H.J. 2018. Recent Costal Resilience Research at Bethune-Cookman's Environmental Science Program. Feb 26, 2018. Halifax Audubon Society.

e. Cho, H.J. Mosquito Lagoon Living shoreline Project using Florida Native Plants. Florida Native Plant Society.

f. Garza, Corey. 2018. Mulitscale habitat drivers of MPA performance: A case study of the spiny lobster (Panulirus interruptus) on Catalina Island. Ocean Sciences Meeting, Portland, OR, 12-16 February 2018.

g. Han, Fengxiang. 2017. Removing Uranium (VI) from Aqueous Solution and Soils with Leonardite-Derived Humic Acid and with Phytoremediation. Fourteenth International Symposium on Recent Advances in Environmental Health Research, September 10th – 13th, 2017, Jackson, MS.

h. Hollander, D.J., P.A. Montagna and 15 others. "Generation apart but of common ancestry: comparison of MOSSFA events and the sediment records from the Ixtoc-1 (1979) and the Deepwater Horizon (2010) marine oil well blowouts in the Gulf of Mexico." Ocean Sciences Meeting, Portland, OR, 12-16 February 2018.

i. Hu, X., M. McCuctheon, H. Yao, M. Wetz, and P.A. Montagna. "Extreme weather event induced changes in estuarine CO2 flux and carbon cycle." Ocean Sciences Meeting, Portland, OR, 12-16 February 2018.

j. Kulawardhana, R. 2017. Characterizing Wetland Land Use/ Land Cover Change Using Medium Resolution Remote Sensing Data: Case Study from Grand Bay National Estuarine Research Reserve of Mississippi, USA. Fourteenth International Symposium on Recent Advances in Environmental Health Research, September 10th – 13th, 2017, Jackson, MS

k. Kulawardhana, Ranjani. 2017. Characterizing Wetland Land Use/ Land Cover Change Using Medium Resolution Remote Sensing Data: Case Study from Grand Bay National Estuarine Research Reserve of Mississippi, USA. Fourteenth International Symposium on Recent Advances in Environmental Health Research, September 10th – 13th, 2017, Jackson, MS

l. Leasi, F., J. Sevigny, H. Bik, K.S. Diaz, P. Montagna, J.L. Norenburg, M. Reuscher, T. Schuelke, and W.K. Thomas. "Evaluating the accuracy of

metabarcoding based biodiversity analysis." Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA, 6-8 February 2018.

m. Long, RA. 2018. NOAA Center for Coastal and Marine Ecosystems. Florida Institute of Oceanography's Ocean Day at the Capitol, Tallahassee. 12 Feb 2018.

n. McLaughlin, Richard. 2017. Who Owns the Water? Oso Bay Wetlands Preserve and Learning Center, Corpus Christi, TX (December 2017)

o. Montagna, P.A. "What we have learned from past platform and oil spill studies." Sanctuary Advisory Council Meeting, Flower Garden Banks National Marine Sanctuary NOAA Lab, Galveston, TX, 15 November 2017. Invited

p. Montagna, P.A. and M. Reuscher. "How suitable are species level and family level identifications of Gulf of Mexico polychaetes for multivariate biodiversity assessments." Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA, 6-8 February 2018.

q. Montagna, P.A. X. Hu, and M. Wetz. "Biogeochemical Impact of Hurricane Harvey on Texas Coastal Lagoons." Ocean Sciences Meeting, Portland, OR, 12-16 February 2018.

r. Murphy, Timothy R., Samuel Mwenda, Adeljean L. Ho, Hyun J. Cho. 2018 Assessing Treatment Wetland Efficacy in Storm water Treatment Utilizing Native Wetland Plants. Indian River Lagoon Symposium 2018, Feb 8-9. 2018, Harbor Branch Oceanographic Institute at Florida Atlantic University

s. Orozco, Andrea, Adeljean Ho, and H.J. Cho. 2018. Effectiveness of Public Education at Controlling Nonpoint Source Pollution along the Mosquito Lagoon. Indian River Lagoon Symposium 2018, Feb 8-9. 2018, Harbor Branch Oceanographic Institute at Florida Atlantic University

t. Orozco, Andrea, Mallory Brooks, Adeljean Ho, and H.J. Cho. Converting Non-natives to Living Shorelines to Control Nonpoint Pollution and used as a Tool for Public education, the 41st Annual Florida Aquatic Plant Management Society Conference, Lake Buena Vista, FL. Oct 16 – 19th, 2017. (CCME student Mallory Brooks travel awarded by the society).

u. Pitter, Sharmini. 2018. NOAA Center for Coastal and Marine Ecosystems. Florida Institute of Oceanography's Ocean Day at the Capitol, Tallahassee. 12 Feb 2018.

v. Rohal, M., E. Escobar-Briones, P.A. Montagna, I. Romero, and D. Hollander. "How quickly will the deep sea ecosystem recover from the 2010 DWH oil spill? Lessons learned from the 1979 Ixtoc-1 oil well blowout event. Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA, 6-8 February 2018.

w. Sevigny, J., F. Leasi, K. S. Diaz, T. Aggarwal, M. Rohal, M. Reuscher, K. Morris, H. Bik, P.A. Montagna, W. Thomas. "The impacts of an expanded set of meiofaunal genome references on the analyses of metagenomic samples collected in the Gulf of Mexico." Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA, 6-8 February 2018.

x. Thoma, Brent. Transcriptomic effects of dispersed oil in a non-model crustacean. Mississippi Academy of Sciences 82nd Annual Meeting, 22-23 February 2018, Hattiesburg, MS.

y. Yoerger, Breier, Curran, Fujii, German, Gomez-Ibanez, Govindarajan, Hobson, Howland, Katija, Llopiz, Pontbriand, Risi, Robison, Rock, Wiebe, "Mesobot: an autonomous underwater vehicle for tracking and sampling midwater targets" Ocean Sciences, 2018.
z. Yoskowitz, David. 2018. Development and Application of Percent Annual Chance Coastal Inundation Maps to Support Decision-Making in the Northern Gulf of Mexico. American Geophysical Union Fall Meeting. December 11-15, 2017. New Orleans, LA

Student Conference Papers, Posters and Presentations:

Table 8: Student Presentations

Student Name	Title	Conference/Meeting/Other
Abraham DaSilvio	Assessing Treatment Wetland Efficacy in Stormwater Treatment Utilizing Native Wetland Plants	Indian River Lagoon Symposium 2018
Brianna Alanis	Clio: a vertical sampling AUV for next-generation ocean sectional studies.	Ocean Sciences, 2018
Diana Del Angel	Assessing Socio-Economic Impacts of Sea-Level Rise Induced Wetland Change (poster)	SACNAS National Conference. October 18-21, 2017. Salt Lake City, UT
Diana Del Angel	Assessing Economic Impact of Storm Surge Under Projected Sea Level Rise Scenarios	American Geophysical Union Fall Meeting. December 11-15, 2017. New Orleans, LA
Elizabeth Del Rosario	Who Owns the Water?	Oso Bay Wetlands Preserve and Learning Center, Corpus Christi, TX (December 2017)
Elizabeth Del Rosario	Environmental Flows Management Strategy for the Coastal Zone in Texas	TAMU-CC Marine Science Graduate Student Organization 7th Annual Research Forum
Harrison Watson	*Examining Polydora websteri (Annelida: Polychaeta: Spionidae: "Mud Blister Worms") Infestation on Crassostrea virginica to Improve Oyster Farming Methods*	Emerging Researchers National Conference, February 22nd – 24th, 2018, Washington, DC
Lily Walker	Biogeochemical Impact of Hurricane Harvey on Texas Coastal Lagoons	Ocean Sciences Meeting, Portland, OR, 12-16 February 2018
Lily Walker	Timescales of Dissolved Oxygen Variability in a Semiarid South Texas Estuary (Baffin Bay)	Coastal & Estuarine Research Federation 24th Biennial Conference, November 5-9th 2017
Mallory Brooks	Living shorelines as tools for citizen science and runoff mitigation	NOAA OAR Pacific Marine Ecosystem Laboratory meeting

Mallory Brooks	Converting Non-natives to Living Shorelines to Control Nonpoint Pollution and used as a Tool for Public education	the 41st Annual Florida Aquatic Plant Management Society Conference
Mallory Brooks	Evaluating the Effectiveness of Living Shorelines in Mitigating Non-point source Pollution and Increasing Soil Carbon Storage in the Mosquito Lagoon Watershed	Indian River Lagoon Symposium 2018
Meghan Martinez	Oyster reef restoration: effects on estuarine macrobenthos	Coastal & Estuarine Research Federation 24th Biennial Conference, November 5-9th 2017
Meghan Martinez	Oyster reef restoration: effects on estuarine macrobenthos	Marine Science Graduate Student Organization 7th Annual Student Research Forum, December 2nd, 2017, Texas A&M University-Corpus Christi Texas
Meghan Martinez	The effects of a restored oyster reef (Crassostrea virginica) on estuarine macrobenthos	Texas A&M Marine Biology IDP 10th Science Symposium, January 12th/13th
Melissa Meredith	Effects of Ocean Acidification and Hypoxia on Larval Brown Rockfish Transcriptomes	Western Society of Naturalists Meeting
Philip Bellamy	Inventory and potential harvesting of non-native aquatic plants in coastal urban waters.	20th Annual Florida Aquatic Plant Management Society Annual Training Conference
Philip Bellamy	A GIS Approach for Determining the Potential Runoff Coefficient and Runoff Depth for the Mosquito Lagoon, FL	NOAA OAR Pacific Marine Ecosystem Laboratory meeting
Philip Bellamy	A GIS Approach for Determining the Potential Runoff Coefficient and Runoff Depth for the Mosquito Lagoon, FL	2017 Indian River Lagoon Symposium
Philip Bellamy	Living shorelines as tools for citizen science and runoff mitigation	2017 Indian River Lagoon Symposium
Prian Vidal	NOAA Center for Coastal and Marine Ecosystems	Florida Institute of Oceanography's Ocean Day at the Capitol, Tallahassee. 12 Feb 2018.
Samuel Mwenda	Assessing Treatment Wetland Efficacy in Stormewater Treatment Utilizing Native Wetland Plants	Indian River Lagoon Symposium 2018
Shan Guruvadoo	Investigating Causes of Changing Tidal Range and Timing in the US	Indian River Lagoon Symposium 2018

Other Publications:
Technologies or Techniques: Nothing to report at this time.

Patents: Nothing to report at this time.

Inventions: Nothing to report at this time.

Licenses: Nothing to report at this time.

Websites:
NOAA CCME website: ccme.famu.edu
Facebook: https://www.facebook.com/noaaccme
Twitter: @NOAACCME

Other Products: Nothing to report at this time.

IV. Participants in Award Performance

Table 9: Award Participants

Name	Most Senior Project Role	Project Hours Worked per Month
Larry Robinson, PhD	Director/Principal Investigator	10
Michael Abazinge, PhD	Associate Director	10
Sharmini Pitter, PhD	Assistant Director	160
Bernadette Kelley, PhD	Education Expert	20
Phyllis Gray-Ray, PhD	Social Science Lead	42
Richard Long, PhD	Co-principal Investigator	26
Hongmei Chi, PhD	Co-principal Investigator	26
Regina Manning	Administrative Coordinator	160
Michael Martinez-Colon, PhD	Faculty advisor	NA, not budgeted under the award
Charles Jagoe, PhD	Faculty advisor	NA, not budgeted under the award
Elijah Johnson, PhD	Faculty advisor	NA, not budgeted under the award
Clayton Clark, PhD	Faculty advisor	NA, not budgeted under the award
Richard McLaughlin	Principal Investigator	29
David Yoskowitz	Co-principal Investigator	21.7
Paul Montagna	Co-principal Investigator	21.7
James Gibeaut	Co-principal Investigator	21.7
Greg Stunz	Co-principal Investigator	21.7
Jennifer Pollack	Faculty advisor	NA, not budgeted under the award
Michael Wetz	Faculty advisor	NA, not budgeted under the award

Name	Most Senior Project Role	Project Hours Worked per Month
Mikell Smith	TAMUCC CCME Coordinator	139
J. Cho	Co-principal Investigator	80
Corey Garza	co-principal Investigator	30
Cheryl Logan	CSUMB mentor	NA not budgeted under the award
Alison Haupt	CSUMB mentor	NA not budgeted under the award
James Lindholm	CSUMB mentor	NA not budgeted under the award
John Goeltz	CSUMB mentor	NA not budgeted under the award
Ivano Aiello	Moss Landing mentor	NA not budgeted under the award
Tim Turner	Principal Investigator	31
Paul Tchounwou	Co-Principal Investigator	1
Paulette Bridges	Program Manager	156
Ibrahim Farah	Co-Investigator	Funded during the summer months
Fenxiang Han	Co-Investigator	Funded during the summer months
Ranjani Kulawardhani	Co-Investigator	Funded during the summer months
Brent Thoma	Co-Investigator	Funded during the summer months
Carlos Cintra	Co-Investigator	
Owen Temby	Co-Investigator	
Erin Easton	Post-doc	160
David Hicks	Principal Investigator	Not budgeted for this year
John “Chip” Breier	Co-Principal Investigator	Not budgeted for this year

***** For each individual listed in this table, additional hours devoted to this award are charged to alternative funding sources.**

What other organizations have been involved as partners?

The following partnerships have continued from the last reporting period.

Type of Partner Organization: State agency

Name: Mississippi Department of Marine Resources
Location: Biloxi, MS
Partner’s Contribution to the Project:

Director of Coastal Resilience and Restoration George Ramseur and Beneficial Use Manager Jared Harris led the field trip to Deer Island during the CWCC. They provided boat

transportation, a boat safety orientation, and an interpretive tour of the habitat restoration projects they have done on Deer Island.

Type of Partner Organization: State university

Name: University of Southern Mississippi

Location: Gulf Coast Research Lab, Ocean Springs, MS

Partner's Contribution to the Project:

Dr. Janet Wright accompanied students and faculty on the field trip to Deer Island during the CWCC and provided an overview of the vegetative monitoring she coordinates for the habitat restoration projects that the MS DMR has implemented on Deer Island. She also engaged students in onsite, hands-on training in transect monitoring and plant species identification.

Type of Partner Organization: NOAA-affiliated State agency

Name: Texas Sea Grant

Location: Houston, TX

Partner's Contribution to the Project:

Walter Peacock and Amanda Solitro provided a training segment on the Community Health and Resources Management (CHARM) GIS mapping tool during the CWCC.

Type of Partner Organization: NOAA-affiliated State agency

Name: Mississippi-Alabama Sea Grant

Location: Ocean Springs, MS

Partner's Contribution to the Project:

Dr. Tracie Sempier provided a training segment on the Coastal Resilience Index during the CWCC.

Type of Partner Organization: Local government

Name: City of Ocean Springs

Location: Ocean Springs, MS

Partner's Contribution to the Project:

During the CWCC Carolyn Martin, the City's Planning and Grants Administrator, provided a segment on a living shorelines project that was developed when they implemented the Coastal Resilience Index. She gave a brief presentation then accompanied students to the project location where she provided a tour.

Type of Partner Organization: Federal

Name: NOAA Flower Garden Banks NMS

Location: Galveston, TX
Partner's Contribution to the Project: CCME project design

Type of Partner Organization: Federal
Name: Deep Coral Ecology Laboratory (DCEL)
Location: Charleston, SC
Partner's Contribution to the Project: CCME Student Training

Type of Partner Organization: NOAA Sanctuary
Name: Monterey Bay National Marine Sanctuary
Location: Monterey, CA
Partner's Contribution to the Project: Dr. Andrew DeVogeleare from the sanctuary serves on the stakeholder advisory group.

Type of Partner Organization: NOAA Office of Sanctuaries
Name: NOAA National Marine Protected Areas Center
Location: Monterey, CA
Partner's Contribution to the Project: Dr. Charles Wahle from the center serves as an advisor to the place based conservation team.

Type of Partner Organization: State
Name: St. Johns River Water Management District
Location: Palatka, FL
Partner's Contribution to the Project: Chuck Jacoby, Stakeholder advisory board member, Environmental management of the special place (Indian River Lagoon, St. Johns River, Halifax River)

Type of Partner Organization: Federal
Name: NOAA National Ocean Service, Center for Operational Oceanographic Products and Services
Location: Silver Spring, MD
Partner's Contribution to the Project: Greg Dusek, External committee member and NOAA mentor for NERTO of CCME student Shan Guruvadoo,

Type of Partner Organization: Federal
Name: NOAA Atlantic Oceanographic and Meteorological Laboratory, Ocean Chemistry & Ecosystem Division
Location: Miami, FL
Partner's Contribution to the Project: Christopher Kelble, External committee member and NOAA mentor for NERTO of CCME student Philip Bellamy

Type of Partner Organization: Higher Education University

Name: Stetson University
Location: DeLand, FL
Partner's Contribution to the Project: Benjamin Tanner

Have other collaborators or contacts been involved? No

Have NOAA collaborators or contacts been involved? Yes

Table 10: NOAA Collaborators

NOAA Collaborator/Office/Program	CCME Faculty/Student Partner(s)	Description of Collaboration
Dr. Rebecca J. Allee, Senior Scientist, NOAA Office for Coastal Management – Gulf Region	Student: Diana Del Angel	NOAA mentor for TAMU-CC CCME fellow Diana Del Angel
Dr. Emma Hickerson, Flower Gardens National Sanctuary	Faculty: Dr. David Hicks	Developing student project for CCME
Dr. Peter Etnoyer's staff, Deep Coral Ecology Laboratory (DCEL) in Charleston, SC	Faculty: Dr. David Hicks	Provided instruction to one CCME student on the diagnostic characters used to distinguish various species of black and gorgonian corals, as well as on the microscopic techniques to visualize these characters.
Dr. Christopher Kelble, AOML, Miami, FL	Student: Philip Bellamy	NERTO mentor
Dr. Gregory Dusek	Student: Shan Guruvadoo	NERTO mentor
Dr. Andrew DeVoglearre, Monterey bay National Marine Sanctuary	Student: Miya McAuliffe	NERTO mentor
Dr. Suzanne Bricker, NCCOS	Student: Lily Walker	NOAA and NERTO mentor for TAMU-CC CCME fellow Lily Walker
Dr. Randall Kosaki, NOAA, Papahānaumokuākea Marine National Monument	Student: Patricia Cockett	NOAA and NERTO mentor for TAMU-CC CCME fellow Patricia Cockett

V. Impacts of Award

What is the impact on the development of future workforce candidates for the principal discipline(s) of the award and NOAA mission-aligned support of the project?

A total of 54 students have been recruited to join NOAA CCME in a variety of disciplines including environmental science, technology, and policy, ocean, coastal and earth science, marine sciences, civil and environmental engineering, biology, computer science, and sociology.

What is the impact on other disciplines and Program Level Outputs and Outcomes aligned with the 2016 FFO? What is the impact on the development of candidates for the NOAA mission future workforce?

The impact on candidate development is tracked and measured through the Individual Student Development Plan. The initial

What is the impact of the Center activities to build institutional capacity in support of the objectives of the NOAA FY16 CSC award?

The Center was able to hire an Administrative Coordinator to assist with the current FY16 and previous FY11 awards. This leveraged position has added support to student training activities, travel, and daily Center activities.

What is the impact of the NOAA award on the Center's data and information resources? To whom and how is this information and the Center accomplishments communicated? Please see Section VI.

How has the Center successfully conducted transfer of research results and new technologies in support of NOAA mission-aligned R2X?

There are no research results or new technologies to report at this time.

What were the societal impacts of the Center research activities? How were or are the impact results communicated to the general public.

At this time research activity results are limited. The NOAA CCME website has been developed to feature research developments and disseminate research results within one year of data collection. As results become available they will also be published in research journals and shared in newsletters, presentations at professional conferences and disseminated through public meetings such as the CCME Ecosystems Day and to key stakeholders with input from the Community Stakeholder Advisory Board.

NOAA CCME management has also had the opportunity to emphasize the importance of NOAA programs to Federal, State and Local officials through yearly visits to Capitol Hill and participation in events such as the FAMU Day at the Capitol.

VI. Changes / Challenges

Challenges in performance of the award objectives - approach and reason(s) for change:

At the time of reporting NOAA CCME has experienced several setbacks in hiring key personnel for the positions of Distinguished Research Scientist and Data, Communication, and Information Manager due to unforeseen circumstances. However, plans have been set to hire these key people early within the next reporting period. The members of the Center Management Team and Education Lead are currently managing the duties of these key members of the NOAA CCME Team.

Actual or anticipated problems or delays and actions or plans to resolve them:

No anticipated delays anticipated at this time.

Changes that have a significant impact on expenditures:

No changes with significant impact on expenditures anticipated at this time.

VII. Special Award Conditions

I. EPP/MSI CSC Performance Progress Reports

NOAA CCME has complied with the requirement that Performance Progress Reports will be provided no later than 30 days following the end of each 6-month period from the start date of the original award. The original submission of the current report occurred on March 30, 2018 in compliance with the special award conditions.

II. Evaluation Plan for Coastal and Marine Ecosystems Cooperative Science Center

The submitted Evaluation Plan for CCME has now been accepted. The External Evaluator met with the Center Management Team several times throughout the reporting period to review the Year 2 Evaluation Plan (Appendix B) and to review progress towards award objectives during Year 1.

III. Required Center Implementation Plan

The Center Implementation Plan was submitted on March 16, 2017 and has since been reviewed. An Implementation Plan Addendum was submitted to Grants Online (File ID: 2676722) on June 30, 2017 to address further suggestions from EPP.

Key Positions: The Distinguished Research Scientist and Data, Communication, and Information Manager will be hired early within the next reporting period. The members of the Center Management Team and Education Lead are currently managing the duties of these key members of the NOAA CCME Team.

Recruitment: Four transfer students and four doctoral students will be recruited to CCME Cohort 2 to meet the Cohort composition outlined in the Implementation Plan.

IV. EPP/MSI CSC Substantial Involvement and Collaborative Engagement

Frequent engagement with NOAA EPP management team with communication and collaboration as NOAA CCME set up the Center under the FY 16 NOAA award requirements. The EPP Supervisor Ms. Jacqueline Rousseau, EPP CSCs Program Manager Dr. Audrey Trotman, and co-Technical Monitors Dr. Steve Thur (NOS) and Dr. Chris Moses (OAR) participate in monthly NOAA CCME calls with the NOAA CCME Center Management Team and Co-PIs to discuss progress updates and upcoming events. The NOAA CCME Associate and Assistant Directors also meet with EPP each week via teleconference to further discuss progress towards award objectives.

Table 11: NOAA Mentors

LAST NAME	FIRST NAME	CSC HOME INSTITUTION	DEGREE LEVEL	ACADEMIC FIELD(S)	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)	Projection for NERTO Completion	NOAA Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest
Alanis	Brianna	UTRGV	M	Earth, Environmental & Marine Sciences	In development	Fall 2018	**Status:** Pending
Bayron-Arcelay	Margarette	FAMU	D	Environmental Science	In development	Fall 2019	Dr. Cheryl Woodley, Research Microbiologist, National Ocean Service
*Bellamy	Philip	B-CU	M	Integrated Environmental Science	A GIS Tool for Determining Potential Runoff Coefficient and Runoff Depth for the Indian River Lagoon Watershed, FL	Fall 2017 - Completed and Graduated	Dr. Chris Kelble, NOAA Atlantic Oceanographic and Meteorological Laboratory
Brooks	Mallory	B-CU	M	Integrated Environmental Science	Evaluating the Effectiveness of Living Shoreline Buffers in Mitigating Nonpoint Source Pollution in the Mosquito Lagoon (ML), Florida, USA.	Fall 2018	Dr. Bill Arnold, NOAA Fisheries Southeast Regional Office

*Graduated during reporting period

LAST NAME	FIRST NAME	CSC HOME INSTITUTION	DEGREE LEVEL	ACADEMIC FIELD(S)	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)	Projection for NERTO Completion	NOAA Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest
Cole	Nemmi	FAMU	D	Civil & Environmental Engineering	In development	Fall 2018	Needed
Cockett	Patricia	TAMUCC	D	Physical & Environmental Sciences	In development	FY 2018	Dr. Randall Kosaki, Hawaii NOAA Estuarine Research, NERTO to take place at Papahānaumokuākea Marine National Monument – **Status:** No SSIO account/project
DaSilvio	Abraham	BCU	M	Integrated Environmental Science	In development	FY 2018	Needed
Del Angel	Diana	TAMUCC	D	Physical & Environmental Sciences	Assessment of Salt Marsh Ecosystem Services in the US Gulf of Mexico	FY 2018	Rebecca J. Allee, Ph.D.; NOAA Office for Coastal Management - Gulf Region; Dr. Mary Culver as NERTO mentor, Office of Coastal Management – **Status:** No SSIO account/project
Del Rosario	Elizabeth	TAMUCC	D	Physical & Environmental Sciences	Environmental Flows Management Strategy for the Coastal Zone in Texas	Fall 2018	Seeking mentor at National Water Center

LAST NAME	FIRST NAME	CSC HOME INSTITUTION	DEGREE LEVEL	ACADEMIC FIELD(S)	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)	Projection for NERTO Completion	NOAA Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest
Eddy	Taylor	CSUMB	M	Marine Science	Multi-scale habitat drivers of MPA Performance	Summer 2018	NERTO site – National Marine Protected Center, SSIO to be created
Guruvadoo	Shan	B-CU	M	Integrated Environmental Science	Wind-driven wave simulation in Indian River Lagoon	Fall 2017 - Completed	Drs. Gregory Dusek; Chris Zervas (CO-OPS); Organization - Jena Kent
Hernandez	Rebekah	UTRGV	M	Ocean, Coastal, and Earth Science	In development	FY 2018	Dr. Emma Hickerson, Flower Garden Banks National Marine Sanctuary
Lascelles	Nigel	FAMU	M	Environmental Science	In development	Summer 2018	Meeting with Dr. Ashok Deshpande
Lima	Anthony	UTRGV	M	Ocean, Coastal and Earth Science	Inter-agency Cooperation, Policy, and Management of the Gulf of Mexico Fishery	FY 2018	NOAA Fisheries Southeast Regional Office
Madrid	Cristina	UTRGV	M	Sociology & Anthropology, Disaster Studies	Resilient Communities: Local Disaster Coordination in the Rio Grande Valley	FY 2018	List of potential mentors shared with EPP
Martin	Kelsey	TAMUCC	D	Environmental Sciences - Marine Biology	In development	Summer 2019	**Status:** Pending
Martinez	Meghan	TAMUCC	M	Life Sciences	Influence of oyster reef restoration on benthic infauna and reef-associated macrofauna	FY 2018	Meeting with Dr. Dionne Hoskins-Brown
Minor	Keenasha	JSU	M	Environmental Science	In development	Fall 2018	**Status:** Pending

LAST NAME	FIRST NAME	CSC HOME INSTITUTION	DEGREE LEVEL	ACADEMIC FIELD(S)	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)	Projection for NERTO Completion	NOAA Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest
Murphy	Elizabeth	UTRGV	M	Ocean, Coastal and Earth Science	Tracking nitrogen transfer through Black Mangrove (*Avicennia germinans*) communities	FY 2018	Synopsis in EPP review
Mwenda	Samuel	B-CU	M	Integrated Environmental Science	Assessing Treatment Wetland Efficacy and Public Education in Stormwater Treatment Utilizing Native Wetland Plants	FY 2018	Seeking potential mentors at NOAA Fisheries Southeast Regional Office
Navarro	Javier	UTRGV	M	Earth, Environmental & Marine Sciences	Exploring the facilitation interaction where Batis maritimaenhances recruitment and establishment of *Avicennia germinans* seedlings.	FY 2018	**Status:** Pending
Parker	Lauren	CSUMB	M	Marine Science	In development	FY 2018	Dr. Andrew Devogelaere, Research Coordinator, Monterey Bay National Marine Sanctuary - **Status:** No SSIO account/project
Pavlock-McAullife	Miya	CSUMB	M	Marine Science	In development	Fall 2018	Dr. Andrew Devogelaere, Research Coordinator, Monterey Bay National Marine Sanctuary
Rosa Marin	Angelique	FAMU	M	Environmental Science	Implementation of the FORAM Index in the coral	Summer 2019	Dr. Cheryl Woodley, Research Microbiologist,

LAST NAME	FIRST NAME	CSC HOME INSTITUTION	DEGREE LEVEL	ACADEMIC FIELD(S)	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)	Projection for NERTO Completion	NOAA Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest
					reef monitoring plan at Jobos Bay (NERR) Puerto Rico		National Ocean Service – **Status:** SSIO in system
Stanley	Ra'Teema	FAMU	M	Computer Science	In development	Spring 2019	**Status:** Pending
Venable	Julian	JSU	D	Environmental Science	In development	Fall 2018	In process to develop
Vidal	Prian	FAMU	M	Environmental Sciences	Nitrogen sequestration associated with Oyster aquaculture at the Oyster Bay FL Aquaculture Use Zone, Wakulla County, FL	Fall 2018	Dr. Suzanne Bricker, Physical Scientist and Manager of NOAA's National Estuarine Eutrophication Assessment, National Centers for Coastal Ocean Science
Walker	Lily	TAMUCC	D	Physical & Environmental Sciences	Dissolved Oxygen Dynamics in Texas Estuaries	FY 2018 or 2019	Dr. Suzanne Bricker, Physical Scientist and Manager of NOAA's National Estuarine Eutrophication Assessment, National Centers for Coastal Ocean Science – **Status:** No SSIO in system

V. EPP/MSI Direct Student Support, Post-Doctoral Program and Pre-Publication

Post-Doctoral Program

During the reporting period NOAA CCME Postdoctoral Research Associate Dr. Erin Easton completed a Center-reviewed postdoctoral plan. The plan has been shared with EPP. Further arrangements of Dr. Easton's research with a NOAA mentor will take place during the next reporting period.

NOAA CCME Postdoctoral Research Associate Dr. Emily Jones will join the NOAA CCME team during the next reporting period.

Pre-Publication Manuscript Submission

NERTO and Student Internships with NOAA

- Four CCME Scholars successfully competed to participate in R/V Okeanos Explorer training opportunities: Rebekah Hernandez, Miya Pavlock-Mcauliffe, Prian Vidal, and Harrison Watson.
- One CCME Scholar, Prian Vidal, was also awarded a slot on the Gulf of Maine Harmful Algal Bloom Cyst Cruise.
- Two CCME Scholar NERTOs have been completed at AOML and NOS CO-OPS.

VI. EPP/MSI Center External Evaluator Support on Award Funds Special Award Condition

VII. NOAA Environmental Data and Information

Currently, there is no collected data and information to report. Sharing of data collected through student research associated with the NOAA CCME will be shared with the public within two years of data collection as described in the CCME Data Management Plan of the award proposal.

VIII. New Award Special Award Condition

This award number NA16SEC4810009, to FLORIDA A & M UNIVERSITY, supports the work described in the Recipient's proposal entitled "NOAA Center for Coastal and Marine Ecosystems" dated March 30, 2016, and revisions dated July 27, 2016 and August 23,2016, which are incorporated into the award by reference. Where the terms of the award and proposal differ, the terms of the award shall prevail.

IX. Multi-Year Special Award Condition

NOAA CCME recognizes that continued funding of the current award is contingent upon availability of funds. The funding period for this award is 09/01/2016 – 08/31/2018 and may be extended through 08/31/2021.

X. EPP MSI CSC Programmatic Special Award Conditions

CSC Programmatic Special Award Conditions

A. Provide FY16 Center award information for the current reporting period:

1. **Number of EPP-funded post-secondary students from underrepresented minority communities** who are trained 48 and graduate 1 in NOAA-mission sciences.
2. **Total number of EPP-funded post-secondary students** who are trained 54 and graduate 1 in NOAA-mission fields relevant to this announcement.
3. **Number of EPP-funded graduates who enter the NOAA mission workforce as hires** by NOAA 0, NOAA contractors 0, NOAA partners 0, resource management agencies 1, NGO community 0, academia 0 or as entrepreneurs 0.
4. **Number of EPP-funded graduates who participate in and complete NOAA agency mission-related postdoctoral level programs** 0.

In Year 2 CCME plans to recruit five transfer students and four PhD students.

5. **Total new funds leveraged with NOAA EPP award** (including post-secondary student support)

   $10,604,174 – Please see Section II for details.

B. Provide FY16 Center award information to demonstrate contribution to supporting CSC Desired Program-level Outcomes and Outputs defined in FFO p. 7 - 10, for the current reporting period.

5.1 Education and Training

Outcome 1. Increased number, annually, of CSC post-secondary students, trained.

Outputs

- Increased quantitative and analytical skills;
- Increased competence in applying STEM to decision making, policy and management; and,
- Increased skills to use large data sets, geographical information systems (GIS) and statistical analysis, computer modeling, and algorithm development.

NOAA CCME Scholars were all invited to attend a webinar and in-person seminar held at the Lead Institution on February 16, 2018 to enhance their understanding of Geospatial Data. Three CCME Faculty/Staff and twelve CCME Scholars were in attendance.

The seminar, titled "The Science of Where: Spatial data for supercharged decision making" was presented by Kimberly Jackson, GIS Administrator of the Office of Technology and Environment at the Florida Department of Environmental Protection.

Outcome 2. Increased number of CSC post-secondary students educated and graduated annually.

Outputs

- The number of degrees earned annually in NOAA mission-related disciplines.

One degree was awarded to Master's student Philip Bellamy from CCME Bethune-Cookman University in the area of Coastal Intelligence. Philip has accepted a position with the National Geospatial-Intelligence Agency.

- 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.

Progress has been made towards NERTO completions. During the reporting period two Center reviewed synopses were shared with EPP to aid in seeking potential NOAA mentors. Several additional synopses were shared with EPP after the reporting period and the resulting progress towards NERTO completion will be included in the next performance progress report.

Outcome 3. Increased CSC capacity to train and graduate students.

Outputs

- 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.

  In addition to OneNOAA Science Seminars NOAA CCME Scholars were all invited to attend a webinar and in-person seminar held at the Lead Institution on February 16, 2018 to enhance their understanding of Geospatial Data.

  The seminar, titled "The Science of Where: Spatial data for supercharged decision making" was presented by Kimberly Jackson, GIS Administrator of the Office of Technology and Environment at the Florida Department of Environmental Protection.

- 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).

  Of the 54 students recruited to join the NOAA CCME 48 (89%) are underrepresented minority students.

Outcome 4. Reduce the attainment gap for URMs in NOAA mission-relevant fields

Outputs

- Increased number of URM students in student development activities that will lead them to the attainment of degrees and/or employment in NOAA mission fields.

- 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

- Number of research collaborations with NOAA and CSC faculty, staff and students.
- Number of NOAA scientists serving as mentors and advisors for student research.

At the time of reporting nine NOAA scientists have agreed to serve as mentors for NOAA CCME student research.

- Number of intra-institutional collaborative partnerships established and maintained in support of NOAA's mission.
- Number of uses of NOAA data in research and tool development.
- Number of inter-institutional collaborative partnerships established and maintained in support of NOAA's mission.

Outcome 2. CSC-supported faculty, staff and students' research directly aligned with NOAA's mission and strategic priorities.

Outputs

- Number of peer reviewed publications, presentations, and tools developed by faculty, staff, and students.

In the current reporting period 4 relevant peer reviewed publications and 26 presentations were produced by CCME faculty and staff, along with 23 presentations by CCME scholars (Section III Products of Award).

- Use of CSC research results and tools by NOAA and other stakeholders.
- Number of instances CSC publications are cited.
- Number of CSC students, staff or faculty recognized nationally for CSC research.

5.3 CSC Administration

Outcome 1. Increased CSC capacity to support and sustain education and research in NOAA mission areas.

Output

- Amount of funds leveraged with CSC award to support NOAA mission in education and research. **$10,604,174 – Please see Section II for details.**

Outcome 2. Increased engagement by CSCs with the URM communities to enhance the mission workforce pipeline.

Outputs

- Number of structured activities to recruit and retain students, particularly from URM communities, in NOAA mission-relevant higher education programs.
- Number of MSI inter-institutional collaborative partnerships established and maintained in support of NOAA's mission.

Outcome 3. To increase communication of CSC accomplishments and capacity
Outputs

- Number of CSC products used by stakeholders.
- Number of featured articles in print or digital media referencing the NOAA CSC.

Three featured articles highlighted the NOAA CCME CSC during the reporting period. News and Events are currently shared and archived through the NOAA CCME website. http://ccme.famu.edu/news-events

1. "Environmental sciences more than just playing with dirt." Malena Hernandez. UTRGV Press release. http://www.utrgv.edu/en-us/about-utrgv/news/press-releases/2018/february-12-environmental-sciences-more-than-just-playing-with-dirt/ February 2018.

2. "Training the Next Generation of Eco Leaders." Pam Berry-Johnson. A&M Magazine. https://issuu.com/floridaamuniversitycommunications/docs/spring_2018_a_m_magazine_web/7 February 2018.

3. "Engaging Minority Students." Ananya Bhattacharyya. p. 20, Diverse Issues in Higher Education. http://mydigimag.rrd.com/publication/frame.php?i=455582&p=&pn=&ver=html5 November 2017.

Outcome 4. Increased use of post-secondary education evaluation methodologies
Outputs

- Number of best practices that are measurable, scalable and transferrable.
- Consistent use of established evaluation practices, including higher education practices, to measure effectiveness of each component of the award.

NOAA CCME will continue development to address all Education and Training Outcomes and Outputs. The Center Faculty and Staff are committed to achieving the goals set forth for the FY16 award to:

Goal 1: Increase the number of well-trained and highly qualified scientists and managers, particularly from under-represented minority groups, entering the NOAA and NOAA-related workforce;

- Goal 2: Enhance the scientific understanding of human interactions with the coastal environment in support of NOAA's place-based management specifically as it relates to

the response of coastal and marine ecosystems to natural and human induced stressors;

- Goal 3: Improve the scientific basis for coastal resource management by developing tools and research products to characterize, evaluate, and forecast coastal and marine ecosystem responses to natural and human induced stressors; and
- Goal 4: Facilitate community education and outreach relating to the function and relevance of coastal ecosystems and the services they provide to society.

Appendix A: Focal Area Student Competencies

	Academic Curriculum/Courses																	Thesis Research	NERTO	WEBINARS	CWCC	Conferences	Volunteering		
	ES510 Organiza. Human Systems	ES511 Organiza. Natural Systems	ES614 Coastal Env. Science	ES605 Environmental Modeling	ES635 Adv. GIS Remote Sensing	ES603 Experimental Design	ES631 Stat. and Numer. Analysis	ES620 Adv. Envir. Economics	ES641 Toxicology Risk Assess.	ES613 Adv. Environmental Ethics	ES501 Environmental Seminar I	ES651 Envir. Restoration	ES550 Ecosystem Management	ES530 Env. Policy Risk Manag.	ES502 Environmental Seminar II (assessed final semester)	ES699 IES Thesis	ES695 Special Problems in IES								
PBC Competency 1 - Policies and Decision Making Tools																								I	Introduce
The policies and commonly-used decision-making tools that support place-base conservation.	I	I	I	R				I	I	R		R	R	R		R	R							R	Reinforce
PBC Competency 2 - Capacity Management																								R*	I+R
The relationship between natural, applied, and social sciences and the policies as it pertains to capacity management.	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	R	R							M	Master
PBC Competency 3 - Engament of Community Stakeholders																								M*	I+R+M
Best practices for engaging community stakeholders in addressing specific site-based concerns.	I							I		I		R	R	R		R								MA	M+Assess
PBC Competency 4 - Ecosystem Valuation Tools and Uses																								A	Assess
Broadly-used ecosystems valuation tools and their use in place-based conservation efforts.	I	I	I		I	I	I	R	R			R	R	R		R									
PBC Competency 5 - Balance between Coastal Resource Use and Economic Development																									
The tools used to balance conservation with demand for coastal resource utilization and economic development.	I	I	I	I	I	I	I	R				R	R			R	R								

Example of table of student competencies based on partner institution curriculum and focal area based on CCME B-CU PBC. Professional development categories related to the Individual Student Development Plan are also included.

Appendix B: Year 2 Evaluation Plan Overview

	CCME Evaluation Question	CCME Project Goal	Related NOAA FFO Program Level Outcomes and Outputs (NOAA-SEC-OED-2016-2004758)	Key Performance Indicators	Evaluation Methodology
PROCESS EVALUATION	1. Has the project been implemented as proposed to date, and if not, what adjustments have been made? Why?	Goal 1 Goal 2 Goal 3	**Not Applicable**	▪ Funds spent based on approved budget allocation ▪ CCME Project Deliverables ▪ Established oversight responsibilities ▪ Submission of Sub-grantee Monitoring Reports	Document analysis Site Visit Observations Questionnaires Interviews Focus Group Discussions
	2. Has the CMT and project administration enhanced the capacity of lead and partner institutions to achieve the Center's goals and objectives in alignment with NOAA's EPP/MSI Program priorities?	Goal 1 Goal 2 Goal 3	**Education and Training** Outcome 2-Output 2 Outcome 3-Output 1 and 2 **Scientific Research** Outcome 1-Output 1, 3, and 5 Outcome 2-Output 1, 2, 3 and 4 **Administration** Outcome 1-Output 1 Outcome 2-Output 1 and 2 Outcome 3-Output 1 and 2 Outcome 4-Output 1 and 2	▪ Number of recruitment activities and agreements ▪ Amount of leveraged funds ▪ Number of partnerships and collaborations ▪ Number of CCME underrepresented minority students enrolled in NOAA-mission related degree programs at partner institutions ▪ Number of seminars, new courses, or new programs developed to increase student proficiency in skills and competencies to support NOAA mission and workforce	Document analysis Questionnaires Site Visit Observations Student/faculty/staff surveys NOAA-mission scientists surveys Interviews Focus Group Discussions
PRODUCT EVALUATION	3. How have CCME activities led to the recruitment, training, and graduation of students, particularly from underrepresented minority groups, with the competencies and skills that support NOAA's Education Strategic Plan, workforce goals and strategic objectives?	Goal 1	**Education and Training** Outcome 1-Output 1,2, and 3 Outcome 2-Output 1 and 2 Outcome 3-Output 1 and 2 Outcome 4-Output 1and 2	▪ Number of CCME underrepresented minority students enrolled in NOAA-mission related degree programs at partner institutions ▪ Percentage of students with the required GPA in NOAA related degree programs at partner institutions ▪ Percentage of CCME students demonstrating learning gains in the competencies related to the CCME Focus Areas (in CWCC and other CCME activities) ▪ Student performance on faculty-guided research projects	Document analysis Site Visit Observations Pre/Post Assessments Student/faculty/staff surveys Interviews NOAA-mission scientists surveys Focus Group Discussions

			Scientific Research Outcome 2-Output 2	▪ Number of scholarly publications and presentations by CCME students and faculty ▪ Student and faculty perceptions of preparedness as measured by survey results. ▪ Number of CCME students who have participated in experiential opportunities at a NOAA Lab, office, or facility ▪ Number of CCME completers who enroll in graduate school or pursue employment in environmental or NOAA-relevant areas ▪ Number of CCME students hired by NOAA, NOAA contractors, and other natural resource and science agencies at the federal, state and local levels	
PRODUCT EVALUATION	4. How have CCME activities enhanced capacity for 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	**Education and Training** Outcome 1-Output 1 and 2 **Scientific Research** Outcome 1-Output 1, 2,3,4, and 5 Outcome 2-Ouput 1, 2, and 3 **Administration** Outcome 2-Output 3	▪ Number of NOAA scientists and CCME faculty serving as research mentors to CCME students ▪ Number and quality of tools produced as a result of research efforts ▪ Number and quality of student and faculty research projects ▪ Number of scholarly publications and presentations by CCME students and faculty ▪ Number of research collaborations with NOAA and CCME student, faculty, and staff	Document analysis Site Visit Observations Questionnaires Student/faculty/staff surveys NOAA-mission scientists surveys Interviews Focus Group Discussions
	5. How have CCME activities enhanced student competencies and skills related to the utilization of new and existing NOAA and other large data archives in decision support tools that promote the vibrancy of coastal and marine ecosystems?	Goal 3	**Education and Training** Outcome 1-Ouput 1, 2, and 3 Outcome 4-Output 1 **Scientific Research** Outcome 1-Output 4 Outcome 2-Output 2 and 3	▪ Number of students trained in the use of NOAA large data sets ▪ Percentage of CCME students demonstrating learning gains in the competencies related to the use of NOAA's large data sets ▪ Number of submissions to new and existing NOAA datasets ▪ Number of CCME sponsored research projects that make use of new and existing NOAA and other large data sets	Document analysis Site Visit Observations Questionnaires Student/faculty/staff surveys NOAA-mission scientists surveys Interviews Focus Group Discussions

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