NOAA CENTER FOR COASTAL AND MARINE ECOSYSTEMS (CCME)

Semi-Annual Performance Report for
Award Number NA16SEC4810009
Reporting Period: March 1, 2019 – August 31, 2019

Lead Institution - Florida A&M University

1601 Martin Luther King Jr. Blvd, Suite 400,
Tallahassee, FL 32307

Dr. Larry Robinson
Director and Principal Investigator

Partner Institutions

Bethune-Cookman University
Dr. Hyun Jung Cho (Institutional PI)

California State University Monterey Bay
Dr. Corey Garza (Institutional PI)

Jackson State University
Dr. Timothy Turner (Institutional PI)

Texas A&M University, Corpus Christi
Dr. Richard McLaughlin (Institutional PI)

University of Texas, Rio Grande Valley
Dr. David Hicks (Institutional PI)

List of Tables

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Acronyms and Abbreviations

FAMU: Florida A&M University

B-CU: Bethune-Cookman University

CSUMB: California State University Monterey Bay

JSU: Jackson State University

TAMUCC: Texas A&M University-Corpus Christi

UTRGV: University of Texas at Rio Grande Valley

CCME: Center for Coastal Marine Ecosystems

CMT: Center Management Team

CSC: Cooperative Science Center

CMT: Center Management Team

CWCC: Center-Wide Core Competency

EPP: Educational Partnership Program

HBCU: Historically Black Colleges and Universities

MSI: Minority Serving Institution

NERTO: NOAA Experiential Research & Training Opportunities

NOAA: National Oceanic and Atmospheric Administration

NOS: NOAA's National Ocean Service

OAR: Oceanic and Atmospheric Research

NMFS: National Marine Fisheries Service

Degree Level: B: Undergraduate, M: Master's, D: Doctoral

NOAA Cooperative Science Center Project Performance Report

I. Executive Summary

This report covers the accomplishments for the reporting period March 1, 2019 - August 31, 2019 for the National Oceanic and Atmospheric Administration's Center for Coastal and Marine Ecosystems (NOAA CCME). During this reporting period NOAA CCME directly supported a total of 85 students (67 active students), 73% (72% active students) from underrepresented minority communities, across three cohorts.

CCME Objective 1. Education and Training (*Specific Objectives 1a and 1d, Special Award Condition V*)

- CCME has graduated 21 students (17 B.S. and 4 M.S.).
- CCME Graduate Scholar Mallory Brooks is currently working for the NOAA Southeast Regional Office as the Fishery Ecosystem Plan (FEP) Coordinator at Caribbean Fishery Management Council as a result of her NERTO. This is a non-Federal contract position.
- Elizabeth Murphy (M.S. student at UTRGV) is working for the Department of Environmental Protection, DLR/Special Reclamation section with the state of West Virginia based out of Philippi, WV. (She will defend this fall and is not presently receiving CCME funding.)
- Cristina Madrid started in August 2019 as a Research Specialist at the Texas Economic Development-Governor's Business and Community Development Division.
- Two CCME Graduate Scholars, Anthony Lima and Nigel Lascelles, have continued in the pipeline to PhD programs within CCME.
- Three CCME Undergraduate Scholars, Brianna Alanis, David Lecusay, Liyah Smith, are continuing in the pipeline in Master's programs within CCME.
- CCME currently has a total of 85 active graduate and undergraduate scholars (41 undergraduates, 34 Master's students, and 14 PhD students; this includes four scholars who have moved on to the next degree level).
- Sixteen CCME Graduate Scholars either completed or started their NERTOs during this reporting period, bringing the total number of students completing NERTOs to 23.
- CCME postdocs Dr. Erin Easton and Dr. Emily Jones are currently working with their NOAA mentors at NOAA facilities.
- The second CCME Center-wide Core Competency (CWCC) Course took place from May 19-24, 2019 in Brownsville and South Padre Island, TX with 42 CCME scholars attending.

Table 1: Number of Funded Students – Fall 2018 - March 2019

Institution	Undergraduate	Master's	Doctoral	TOTALS
Cohort 1				
FAMU	9	3	-	12
B-CU	-	4	-	4
CSUMB	1	3	-	4
JSU	7	1	1	9
TAMU-CC	-	1	4	5
UTRGV	5	4	-	9
Cohort 2				
FAMU	2	1	4	7
B-CU	-	1	-	1
CSUMB	1	-	-	1
JSU	2	-	-	2
TAMU-CC	-	-	2	2
UTRGV	2	2	-	4
Cohort 3				
FAMU	3	5	1	9
B-CU	-	1	-	1
CSUMB	3	2	-	5
JSU	3	-	-	3
TAMU-CC	-	3	2	5

UTRGV	3	3	-	6
Total Supported				**89***
TOTAL Active				**61**
Graduated	18	5	-	23

** 85 total students. 4 students have finished one degree with the program and have moved on to the next degree level.*

CCME Objective 2. Scientific Research (*Specific Objectives 2a-2c*)

- CCME Research focuses on the areas of Coastal Resilience, Coastal Intelligence and Place-Based Conservation. Examples of NERTOs completed this period in these three focal areas include:
    - Coastal Resilience – NERTO Completed: CCME Scholar Samuel Mwenda, *Identification of cost-effective salt marsh restoration opportunities along the South Atlantic coast*
      NERTO mentor: Leslie Craig, NOAA Fisheries Southeast Regional Office
    - Coastal Intelligence – NERTO Completed: CCME Scholar Andrea Pugh, *Numerical Simulation of PFAS in the Great Lakes*
      NERTO mentor: Dr. Mark Rowe, NOAA Great Lakes Environmental Research Laboratory
    - Place-Based Conservation – NERTO Completed: CCME Scholar Julian Venable, *Characterization of microplastics collected from marine environments*
      NERTO mentor: Dr. Ashok Deshpande, NMFS/ Northeast Fisheries Science Center, Sandy Hook
- During this reporting period, CCME had five student publications in peer-reviewed journals, four faculty publications, and two student theses published.
- During this reporting period, CCME had eight student presentations and 21 faculty presentations at conferences, meetings, and workshops.

CCME Objective 3. CSC Administration

- CCME Science Advisory Council and Community Stakeholder Advisory Board members have enhanced participation in CCME activities through attendance on CCME monthly calls and participation in the CCME Annual Meeting at SWFSC, La Jolla, CA, on April 11-12, 2019.
- NOAA CCME conducted a site visit of CCME Partner Institution TAMU-CC on May 24, 2019.
- Lead CCME Institution FAMU hosted faculty from B-CU on April 30 to develop new collaborations and add new affiliated faculty and undergraduates to CCME.

Looking to Year 4

CCME Objective 1. Recruitment (See Specific Objective 1a)

- In order to meet the established Year 4 recruitment goals NOAA CCME will recruit 9 Community College Transfer students, 11 Master's students, and – applications are currently under review.
- Planned recruitment efforts will include scientific conferences such as SACNAS and CERF as well as individual recruitment efforts at locally affiliated community colleges.

CCME Objective 1. Student Training (See Specific Objectives 1a, 1c and 1d)

- NOAA CCME Expects the completion of several NERTOs by the end of Year 4 and is currently seeking mentors.
- 19 CCME Scholars are expected to graduate within Year 4

CCME Objective 2. Research

- CCME faculty and staff planned a CSC Special Session titled *Education Partnerships in Coastal and Marine Science* as part of the Coastal and Estuarine Research Federation (CERF) Conference to be held in November of 2019.
- CCME will host the 10th Biennial NOAA EPP/MSI Forum in March, 2020 at Florida A&M University, which CCME scholars and faculty conducting research will attend and present their work.

CCME Objective 3. CSC Administration

- NOAA EPP/MSI conducted a NOAA EPP/MSI Biennial Forum planning visit on June 19-20, 2019.
- NOAA CCME will have its fourth-year review January 21-24, 2020, at FAMU.

Key Personnel

- NOAA CCME Key Personnel hires are now complete.

NOAA CCME Focal Area Participants

Administration

Center Director: Larry Robinson, Ph.D.
Associate Director: Michael Abazinge, Ph.D.
Assistant Director: Sharmini Pitter, Ph.D.
Distinguished Research Scientist: Steve Morey, Ph.D.
Data, Communication, and Information Manager: Kris Suchdeve
Administrative Coordinator: Sherry Wells

Institutional Principal Investigators

CCME B-CU: J. Cho, Ph.D.
CCME CSUMB: Corey Garza, Ph.D.
CCME JSU: Tim Turner, Ph.D.
CCME TAMUCC: Richard McLaughlin, Ph.D.
CCME UTRGV: David Hicks, Ph.D.

Committee Leadership

Education Expert: Bernadette Kelley, Ph.D.
Social Science Lead: Phyllis Gray-Ray, Ph.D.
Coastal Intelligence Co-Chairs: Richard Long, Ph.D.; Paul Montagna, Ph.D.
Coastal Resilience Co-Chairs: Owen Temby, Ph.D.; David Yoskowitz, Ph.D.
Place-Based Conservation Co-Chairs: J. Cho, Ph.D.; Corey Garza, Ph.D.

Focal Area Participants – Faculty

Coastal Intelligence:
Elijah Johnson, Ph.D., Florida A&M University
Michael Abazinge, Ph.D., Florida A&M University
James C. Gibeaut, Ph.D., Texas A&M University at Corpus Christi
Hongmei Chi, Ph.D., Florida A&M University
J. Cho, Ph.D., Bethune-Cookman University
Emily Jones, Ph.D., Florida A&M University
Timothy Turner, Ph.D., Jackson State University
Paul Tchounwou, Ph.D., Jackson State University
Charles Jagoe, Ph.D., Florida A&M University
Corey Garza, Ph.D., California State University-Monterey Bay
Phyllis Gray-Ray, Ph.D., Florida A&M University

Coastal Resilience:
Richard McLaughlin, Ph.D., Texas A&M University at Corpus Christi
Phyllis Gray-Ray, Ph.D., Florida A&M University
J. Cho, Ph.D., Bethune-Cookman University
Hongmei Chi Ph.D., Florida A&M University
Elijah Johnson, Ph.D., Florida A&M University

Place-Based Conservation:
David Hicks, Ph.D., University of Texas Rio Grande Valley
Charles Jagoe, Ph.D., Florida A&M University
Phyllis Gray-Ray, Ph.D., Florida A&M University
Michael Abazinge, Ph.D., Florida A&M University

Carlos Cintra, Ph.D., University of Texas Rio Grande Valley
Alejandra Fierro-Cabo, Ph.D., University of Texas Rio Grande Valley
Erin Easton, Ph.D., University of Texas Rio Grande Valley
Richard McLaughlin, Ph.D., Texas A&M University at Corpus Christi
Paul Montagna, Ph.D., Texas A&M University Corpus Christi
Dr. Greg Stunz, Ph.D., Texas A&M University Corpus Christi
Dr. David Yoskowitz, Ph.D., Texas A&M University Corpus Christi
Brent Thoma, Ph.D., Jackson State University
Timothy Turner, Ph.D., Jackson State University
Ranjani Kulawardhana, Ph.D., Jackson State University

Cross-cutting Area Participants

Social Science
Richard McLaughlin, Ph.D., Texas A&M University at Corpus Christi
Phyllis Gray-Ray, Ph.D., Florida A&M University
J. Cho, Ph.D., Bethune-Cookman University
Hongmei Chi Ph.D., Florida A&M University
Elijah Johnson, Ph.D., Florida A&M University

Education
J. Cho, Ph.D., Bethune-Cookman University
Sarah Krejci, Ph.D., Bethune-Cookman University
Leticia Contreras, University of Texas Rio Grande Valley
Laura Good, Ph.D., California State University-Monterey Bay
Brent Thoma, Ph.D., Jackson State University
Ranjani Kulawardhana, Ph.D., Jackson State University

Focal Area Participants – Students (See Appendix Table 1)

I. Accomplishments

Major Activities: See Executive Summary

Significant Results: See Executive Summary

Key outcomes or other achievements: See Executive Summary

NOAA CCME Areas of Focus

NOAA CCME focuses on three areas of research including: Coastal Resilience (CR), Coastal Intelligence (CI), and Place-Based Conservation (PBC), along with two cross-cutting teams for Education and Social Science. Faculty and scholars conducting research are assigned to one of the three focal areas for reporting and assessment purposes, but integration between these focal areas occurs during combined monthly center-wide meetings and monthly calls for the CR, CI, PBC and the Social Science teams. Faculty and scholars from all focal areas participated in the CCME Center-Wide Core Competency course (CWCC) hosted by UT-RGV this summer. Faculty members provided lectures both online prior to the CWCC and in person during the course.

The CWCC covered previously developed CCME scholar core competencies and were reinforced by hands-on activities. In addition to the CWCC, CCME and the focal areas facilitate student development of those competencies as follows:

- For graduate students:
    - Through courses required for their degree programs;
    - Through their research;
    - Through CCME training, such as the CWCC, NERTO, and internships;
    - Through mentoring opportunities with NOAA personnel.
- For undergraduate students:
    - Through courses required for their degree programs;
    - Through participation in NOAA and CCME webinars;
    - Through mentoring opportunities with NOAA personnel.

The following are the events, activities, outputs and outcomes by CCME students towards meeting each of the competencies:

- Developing synopses
- Conducting graduate research
- Participation in and presentation at conferences
- The 2019 CWCC
- Conducting workshops, public education, and surveys with the community/local government entities
- Attending local town hall meetings and planning board meetings
- Attending NOAA Webinars
- Engaging NERTO and NOAA mentors
- Developing tools and reports for NOAA through NERTO projects
- Conducting NERTO research and writing NERTO report

Coastal Resilience Summary

To date, a total of seven NOAA CCME graduate students (Appendix 2) have identified coastal resilience as the primary focal area for their research, two pursuing doctoral degrees and five working toward, or having completed a Master's degree. Four students have completed their NERTOs and three are seeking NERTO projects and mentors. One has graduated and all of them, except the newest student recruited August 2019, have presented their research project ideas to the Coastal Resilience Committee. Their research project synopses have been uploaded to Taskstream, approved by the CR, and submitted to the CCME Management Team.

Former CCME Master's Scholar Anthony Lima commenced work on a Ph.D. in Coastal and Marine Systems Science in January 2019 at TAMUCC working under Dr. Richard McLaughlin and chose Coastal Resilience as his focal area. On the July CR conference call, he provided a presentation on his planned dissertation project entitled "Exploring Oyster Aquaculture Potential and Investigating Economic, Ecological, and Legal Barriers". The project will look at oyster aquaculture regulation and the impact of a new Texas law on development of the industry as well as key issues that still need to be worked out. He plans to develop a tool that could assist with site assessment for the Texas coast. Faculty provided excellent input and the group accepted the synopsis as written.

Juliet Vallejo joined the NOAA-CCME as a coastal resilience student in August 2019. She is a M.S. student in Ocean, Coastal, and Earth Sciences at UTRGV, under the supervision of Dr. Owen Temby. Her research is on institutions managing scientific knowledge about the Gulf of Mexico ecosystem. She will complete and submit her synopsis shortly.

During the March and April combined calls for the CR, PBC, and Social Science Committee, members CR faculty continued discussions and planning for the May 2019 CWCC, clarifying some of the final timing and logistical details. In July, with the 2019 event fresh in mind, the group initiated discussion of the next CWCC to be hosted by CSUMB in 2022. Dr. Garza shared several potential partners in the Monterey Bay area and will begin thinking about possible problem cases for the problem-based learning activity. Once that is identified, faculty will begin considering how they can contribute.

CR Goals:
The CR did well on its Year 3 goals but recognized that recruitment is not actually a focal area activity. Three students (León Pérez, Lima, and Vallejo) were added to the coastal resilience focal area during Year 3, meeting the recruiting goal, but the decision remains with students and their faculty advisors to determine which focal area they will work within.
These are the CR objectives for the 5-year funding period.

1. Apply knowledge of natural and nature-based infrastructure to address issues of extreme weather events
2. Engage in community-based approaches for implementation of natural and nature-based infrastructure
3. 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
4. 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 on NOAA CCME CR Competencies:
Accomplishments this reporting period:

1. Status of Students (Appendix Table 1):
    a. The CR focal area has a total of 6 active students from the six CCME institutions: 2 Ph.D. and 4 M.S.; one student graduated with an M.A., bringing the total CR students to 7.
2. Student synopses submitted to and approved by CR (Appendix Table 1)
    a. One new student synopsis was presented and approved.
    b. Total of 6 synopses (out of 7 graduate students) have been presented and approved at the focal area.
3. Student NERTO updates (Appendix Table 1)
    a. Four students have completed a NERTO
        - Mallory Brooks
        - Cristina Madrid
        - Miya Pavlock McAuliffe
        - Sam Mwenda
    b. The two new CR students are seeking NERTO projects but set scheduling goals.
        - Mariana León Pérez (fall 2020)
        - Anthony Lima (summer 2021 or 2022)
        - Juliet Vallejo (summer 2020)
4. Student completion of program
    a. None during this reporting period.
5. CR members Mikell Smith and Richard McLaughlin received notice that the 2019 Coastal & Estuarine Research Federation (CERF) conference provided two 90-minute time blocks for the session "Education Partnerships in Coastal and Marine Science". The session was scheduled for Thursday, November 7, 2019 from 8:00 through 11:30 am. The first segment will feature NOAA EPP and the Cooperative Science Centers, with a panel discussion followed by faculty and student presentations. Six other educational partnerships will share their programs during the remainder of the session. Smith and McLaughlin are participating in the CERF underserved, underrepresented minority program "Rising Tides". Owen Temby and Anthony Lima are also presenting at the conference. NOAA CCME will host a booth for recruiting purposes.
6. Dr. Owen Temby, CR Chair, and his colleagues at UTRGV, hosted the 2019 CWCC in South Texas May 19 – 24. CR students and faculty participated, with faculty facilitating and supporting the training activities.

Coastal Intelligence Summary

In the current reporting period, CI has a total of 29 active CCME Scholars (5 Ph.D., 11 M.Sc. and 13 B.Sc.) (Appendix Table 1). This includes two new M.Sc. students and two Bachelors/community college transfer undergraduates. Four CCME graduate students presented and had their synopsis approved by the CI focal area this reporting period. In total, CI has approved eleven (4 Ph.D. and 8 M.Sc.) student proposal synopses (Appendix Table 1). Eleven (of the thirteen) CCME CI Graduate Scholars have identified NOAA and NOAA NERTO mentors (Appendix Table 1). Six additional Scholars completed their NERTO during this period, for a total of ten CCME CI Scholars that have completed their NERTOs. Two scholars defended their theses, and a third defended her thesis but is revising the written component.

Dr. Emily Jones, the second CCME Postdoctoral Researcher, had her NOAA Post-Doctoral Collaboration (PDC) proposal entitled "Impacts of Mangrove Expansion into Northern Gulf of Mexico Salt Marshes" with Dr. Jennifer Doerr at the NOAA Southeast Fisheries Science Center (SEFSC) in Galveston, TX approved. She participated in fieldwork with Dr. Doerr and collaborators in Louisiana August 12th to 23rd. CCME graduate scholar Javier Navarro (UT-RGV in PBC) also was part of the field team as part of his NERTO. Dr. Jones is scheduled to start her NOAA PDC September third.

There are 19 CI faculty mentors at the six institutions, with a subgroup that meets for monthly combined CCME PBC/CR/CI/Social Science conference calls on the 4th Monday of the month. Also participating in the calls are CCME Assistant and Associate Directors, the Education Lead, the Distinguished Research Scientist, and Postdoctoral Researchers. CI faculty members also serve as advisors and supervise student projects submitted to other focal areas in the topics of Place-Based Conservation and Coastal Resilience, as many of the student projects cross-cut the focal areas.

Several CI focal area faculty members participated in the CCME Annual meeting held at Southwest Fisheries Science Center in La Jolla, CA. Two CCME scholars also attended the meeting and presented posters of their research during the meeting.

CCME students and faculty continue to engage in numerous research/outreach/education/ community events and activities aligning with CI at the campus, local, regional, and national scales.

Coastal Intelligence Goals: To recruit, train and graduate CCME Scholars to generate and use existing data stream and decision-support tools for: 1) ecosystem assessment and restoration 2) to address coastal stressors and hazards. CCME Scholar research products should extend Coastal Intelligence to support Place Based Conservation and Coastal Resilience efforts of various groups, including policy makers and stakeholders.

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 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

Accomplishments this reporting period:

1. Status of CCME Student Scholars (Appendix Table 1):
    a. The CI focal area has a total of 29 students from the six CCME institutions: 5 Ph.D., 11 M.Sc., and 13 B.Sc. scholars, including 4 community college transfer.

2. Student synopses submitted to and approved by CI (Appendix Table 1)
    a. Four new student synopses were presented and approved.
    b. A total of 14 synopses have been presented and approved at the focal area (one Scholar graduated in a previous reporting period and is not included in Appendix Table 1).

c. In addition to their written synopsis, Scholars are now required to provide an oral presentation of their synopsis to the focal area during the monthly calls.

3. Student NERTO updates (Appendix Table 1)

a. Six students completed their NERTO this period:
- Andrea Pugh
- Brianna Alanis
- Caroline Rodriguez
- Keenasha Minor
- Queriah Simpson
- Ra'Teema Etienne

b. Three are currently scheduled for Fall 2019:
- Patricia Cockett
- Angelique Rosa-Marin
- Prian Vidal

c. Two are currently scheduled for 2020:
- Lily Walker
- Margarette Bayron-Arcelay

d. Three graduate students have identified NOAA/NERTO mentors and NERTO locations and are working on SSIO:
- Daryin Medley
- Liyah Smith
- Ariana Uwaibi

4. Student completion of program:
- Shan Guruvadoo, **BCU** Defended thesis April 2019
- Keenasha Minor, **JSU** Defended thesis, written in revision
- Ra'Teema Etienne, **FAMU** Defended thesis August 2, 2019.
- Olivia Boisen, **CSUMB** graduate with bachelor's June 2019.
- Melissa Meredith, **CSUMB** graduate with bachelor's June 2019.

5. Leveraged **<u>Student</u>** Research/Training/Outreach Activities

Angelique Rosa-Marin, FAMU, participated in the ASLO's 2019 Limnology and Oceanography Research Exchange (LOREX) program in Australia. Operated by Advancement of the Sciences of Limnology and Oceanography with support through NSF. Website (https://www.aslo.org/page/lorex)

Angelqiue Rosa-Marin, FAMU**.** Traveled to PR to give in-service teacher workshops as part of the Puerto Rico Sea Grant proposal that is being leveraged.
Funding Organization: Puerto Rico Sea Grant
Organization hosting the workshop: Jobos Bay National Estuarine Research Reserve
Activity: In-service teacher workshops
Date: May 2019

Angelique Rosa Marin, FAMU. Traveled to PR to do field work for her thesis.
Organization hosting the field research: Jobos Bay National Estuarine Research Reserve Dates: March 2018, Sept. 2018, Dec. 2018, March 2019, Aug. 2019. Puerto Rico Sea Grant.

Margarettte Bayron-Arcelay, FAMU. Traveled to Apalachicola (FL) and Corpus Cristi/Nueces Bay (TX) to do field work for her PhD Dates: April 2019

Organization hosting the field research in FL: Apalachicola Bay National Estuarine Research Reserve
Organization hosting the field research in Texas: TAMUCC.

Nigel Lascelles, FAMU. E/V Nautilus cruise June 11-22, 2019. Assisted with seafloor mapping of Pacific seamounts.

Patricia Cockett, TAMU-CC. Attended a PRIMER-e workshop in July 2019.

Summer Martinez, FAMU. Attended the NOAA OR&R Science of Oil Spills course. Mobile, AL. Mar 25-29, 2019.

Aaliyah Brown, FAMU. Participated and had an oral presentation in the FAMU Worlds Scholar Research Experience for Undergraduates. Ten weeks, summer 2019.

Summer Martinez, FAMU. Participated and had an oral presentation in the FAMU Worlds Scholar Research Experience for Undergraduates. Ten weeks, summer 2019.

6. NOAA CCME Postdoctoral Activity

Dr. Emily Jones. NOAA Postdoctoral Internship with Jennifer Doerr and Jennifer Leo from NOAA Southeast Fisheries Science Center on a project examining shrimp growth in salt marsh and mangrove habitats in Port Fourchon, LA. Start date Sept 3, 2019.

Place-based Conservation Summary

The Place-Based Conservation Focal Area (PBC) has a total of 31 students from the six CCME institutions: 4 Ph.D., 14 M.S., and 11 B.S level, and 2 transferred students. Among the 18 graduate students, 15 presented their research synopses to the focal area faculty (Appendix Table 1). Nine B.S. students graduated during this reporting period; seven of them were admitted to graduate programs to continue academic research/career. Two CCME B.S. students who graduated were admitted to the M.S. program at UTRGV and funded by CCME. Anthony Lima, a CCME M.S. student who graduated with M.S. from UTRGV began his CCME Ph.D. program at TAMUCC. The presented synopses were reviewed, edited, and approved at the PBC level and submitted to the CCME Management Team. Thus far, nine students have completed NERTO; three are currently underway. Seven of the NERTO projects occurred this reporting period (Mar – Aug 2019) (Appendix Table 1). Postdoctoral researcher, Dr. Easton is on her 6-month NERTO tenure at the NOAA's Deep-Sea Coral Ecology laboratory at NCCOS in Charleston, South Carolina. PBC core competencies have been reviewed and approved. The 2019 on-site CWCC was completed. CCME students and faculty are actively engaged with numerous

research/outreach/education/community events and activities aligning with PBC at the campus, local, regional, and national scales (Appendix Table 3).

PBC Goals: 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 conservation and restoration at given locations and situations 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 CCME PBC Competencies: The PBC worked with External Evaluator to finalize seven competencies for the PBC students to achieve prior to their completion of the CCME program. In order to facilitate assessment of the students meeting the required competencies, a competency matrix chart was completed through inputs from the CCME institutions of their degree programs' curricula and required activities for students. Current academic curricula required for the CCME students at each of the partner institutions provide topics and lectures. The new 2019 PBC CWCC online modules and on-site agenda were and are being designed to ensure the exercises and information will enable the students to gain the competencies if successfully completing the modules.

Accomplishments this Reporting Period:

7. Status of Students (Appendix Table 1):
    a. The PBC focal area has a total of active 31 students from the six CCME institutions: 4 Ph.D.; 14 M.S.; and 13 B.S level including 2 community college transfer students.
        - Three M.S. students were added to the focal area since the last report in February 2019
8. Student Synopses Submitted to and Approved by PBC (Appendix Table 1)
    a. One new student synopsis was presented and approved.
    b. Total of 15 synopses (out of 18 graduate students) have been presented and approved at the focal area, with three (3) presented in this report period.
9. Student NERTO Updates (Appendix Table 1)
    a. Nine students have completed NERTOs:
        - Diana Del Angel
        - Julian Venable
        - (Ashley) Elizabeth Murphy
        - Megan Martinez
        - Taylor Eddy

- Lauren Parker
- Rebekah Hernandez
- Anthony Lima

b. Three are currently scheduled in spring 2019 NERTO:
   - Elizabeth del Rosario
   - Javier Navarro
   - Alexandra Thomsen

c. Seven NERTO projects occurred this reporting period.

d. Five graduate students are currently seeking assistance or in communication with potential NERTO mentors and locations.

10. Student Completion of Program and Placement

a. Anthony Lima, a CCME Scholar who graduated with an M.S. from UTRGV began his CCME Ph.D. program at TAMUCC.

b. Nine B.S. graduated in this period, seven of them were admitted to graduate programs to continue academic research/career. Two of them graduated from a CCME B.S. program and admitted to the CCME M.S. program at UTRGV.
   - David Lecusay was admitted to the Ocean, Coastal and Earth Sciences (OCES) M.S. CCME program at UTRGV. He is now a PBC M.S. student.
   - Sandra Leal was admitted to the OCES MS CCME program at UTRGV. She is now (Fall 2019) a PBC M.S. student.
   - Harrison Watson was admitted to the Ecology and Evolutionary Biology Ph.D. program at Princeton University where he was offered their Presidential Fellowship and Hanna Scholarship.
   - Jessica Webb was admitted to the Entomology Ph.D. program at UC Riverside and offered a Chancellor's Fellowship.
   - Jada Grant was admitted to the Biology M.S. program at the Illinois Institute of Technology.
   - Jonathan Breaux was admitted to Medical School at the University of Mississippi Medical Center.
   - Shelby Windham was admitted to the M.S. in Medical Sciences Program at the University of Kentucky.

c. Elizabeth Murphy (M.S. student at UTRGV) is working for the Department of Environmental Protection, DLR/Special Reclamation section with the state of West Virginia based out of Philippi, WV. Her job position started on June 10, 2019 (she is no longer receiving CCME funds and plans to defend her thesis this fall), her title is Environmental Resource Specialist I.

11. Other Outputs and Outcomes toward Meeting PBC Competencies

a. The following is the list of the PBC Core Competencies
   1. The policies and commonly-used decision-making tools that support place-based conservation.
   2. The relationship between natural, applied, and social sciences and the policies as it pertains to capacity management.
   3. Best practices for engaging community stakeholders in addressing specific site-based concerns.
   4. Broadly-used ecosystems valuation tools and their use in place-based conservation efforts.
   5. The tools used to balance conservation with demand for coastal resource utilization and economic development.

6. Understand socio-economic data needs.
7. Engage community stakeholders.

b. Appendix Table 1 lists titles of the NERTO projects conducted by the PBC students
c. Appendix Table 2 lists the type of outputs/outcomes produced from the CCME student NERTO projects.
d. NFWF-Connecting Youth to Coastal Habitat Restoration in Texas, National Fish & Wildlife Foundation, $249,293, Jennifer Pollack, (CCME TAMUCC).

II. Products of Award

Degrees Awarded: Award Total: *17 B.S., 4 M.S.*

Student Publications in Journals:
Only publications with CCME award attribution are included.
[* indicates CCME Scholar; ** CCME-affiliated faculty, *** NOAA Federal or Affiliate]

1. Bellamy*, P., and H.J. Cho**. (2019). A GIS-based Approach for Determining Potential Runoff Coefficient and Runoff Depth for the Indian River Lagoon, Florida, USA. In *Lagoon Environments Around the World-A Scientific Perspective* (Ed. Andrew Manning), IntechOpen, DOI: 10.5772/intechopen.87163.

2. Boisen*, O., Corral, A., Pope, E., & Goeltz, J. C. (2019). Quantifying the Cross-Sensitivity of Glass pH Electrodes in Alkaline Solutions. *Journal of Chemical Education, 96*(7), 1418-1423. doi:acs.jchemed.8b00812.

3. Wu, D. and Del Rosario*, E.A. (2019). Exploration of Citizen Science Data and Potential Application to the National Water Model. (JAWRA-19- 0109-P). *Journal of the American Water Resources Association.* In Review (as of 22 Aug 2019).

4. León-Pérez* M.C., R.A. Armstrong., W.J. Hernández, and A. Aguilar-Perera (2019). Seagrass Cover Expansion off Caja de Muertos, Puerto Rico, as determined by Long-term Analysis of Historical Aerial and Satellite Images (1950 – 2014). *Ecological Indicators,* In Review (as of 22 Aug 2019).

5. Wu, D. and Del Rosario*, E.A. (2019). Exploration of Citizen Science Data and Potential Application to the National Water Model. (JAWRA-19- 0109-P). *Journal of the American Water Resources Association*. In Review (as of 22 Aug 2019).

Faculty Publications in Journals:
1. Brokaw, R.J., B. Subrahmanyam, S.L. Morey** (2019). Loop current and eddy driven salinity variability in the Gulf of Mexico. *Geophys. Res. Let.* 46, 5978-5986. .DOI: 10.1029/2019GL082931

2. Garza**, C. (2019). Landscape Ecology in the Rocky Intertidal: Opportunities for Advancing Discovery and Innovation in Intertidal Research. *Current Landscape Ecology Reports*, 1-8. doi:10.1007/s40823-019-00042-8.

3. Paudel, B., P.A. Montagna** and L. Adams (2019). Water quality data from estuarine variable hydrologic flow regimes during frequent drought. *Data in Brief 25*:104178, doi: 10.1016/j.dib.2019.104178.

4. Paudel, B., P.A. Montagna** and L. Adams (2019). The relationship between suspended solids and nutrients with variable hydrologic flow regimes. *Regional Studies in Marine Science 29*:100657, doi: 10.1016/j.rsma.2019.100657

Editor of Special Journal Issues:

Books:

Book Chapters:

Thesis/Dissertations:

1. Etienne, R. (2019). Predicting Florida rip currents via data imaging analytics techniques. Thesis. Florida Agricultural and Mechanical University.

2. Guruvadoo, S. (2019). Investigating causes of changing tidal range and timing in U.S. harbors. Thesis. Bethune-Cookman University.

Conference Papers, Posters and Presentations:
Student Presentations

1. Camarillo, D. Jr., S.A. Leal*, and C.E. Cintra-Buenrostro** (2019). Fishes relative abundance and diversity of San Martin Lake, TX. UTRGV Engaged Scholar Symposium.
2. Hernandez, L., D. Lecusay Jr.*, M. Delgado, C.E. Cintra-Buenrostro** and A. Fierro-Cabo** (2019). Sediment carbon storage in a mangrove-marsh-mudflat continuum of the Laguna Madre, Texas. UTRGV Engaged Scholar Symposium.
3. Lima* A. (2019). Trust and Influence in the Gulf of Mexico's Fishery Public Management Network. Annual Conference of the New England Political Science Association.
4. Martin*, K.L., and G.W. Stunz** (2019). Fish community comparison over differing habitats along the Texas shelf. Joint Meeting of Ichthyology and Herpetology.
5. Martinez*, M., T. Palmer, N. Breaux, and J.B. Pollack (2019). Rebuilding Resilient Habitat: Influence of Oyster Reef Restoration on Development of Oysters, Infauna, and Reef-associated Macrofauna in St. Charles Bay, TX. Aquaculture Triennial Conference.
6. Walker*, L. (2019). Science of Conservation. Coastal Conservation Association 2019 National Board Meeting.
7. Walker*, L. Wetz**, M. (2019). Ecosystem Responses to Hurricane Stressors. Hurricane Synthesis Workshop 2019.
8. White, M., S. Mwenda*, A. DaSilvio*, and H.J. Cho** (2019). Construction of a treatment wetland to reduce nutrient loading from stormwater runoff into coastal waters. 2019 Academic Showcase, Bethune-Cookman University.

Faculty Conference Papers, Posters, and Presentations:

1. Breier J**. A., Jakuba, M.V., Saito, M.A., Chan, E., Mcilvin, M.R., Moran, D., Alanis, B*. Johnson, R. (2019). Revealing Ocean Biochemical Structure with High-Resolution Sampling from an Autonomous Underwater Profiling Vehicle: CLIO. ASLO Aquatic Sciences Meeting.

2. Breier**, J.A., M. Jakuba, M. A. Saito , G. Dick, D. Gomez-Ibanez, K. Tradd, S.L. Grim, R. Chmiel, M. R. McIlvin, A.E. Noble, B. Alanis*, M.M. Kellogg, and J. Garcia* (2019). CLIO: A Vertical Sampling AUV for Next-Generation Ocean Sectional Studies. AGU Ocean Science Meeting.

3. Cho**, H.J. and A. Ho (2019). Living Shorelines for the control of nonpoint source pollution along the Mosquito Lagoon. The City of Edgewater.

4. Easton**, E. E., D. Hicks, and C. Pavliska (2019). What do mitogenome studies reveal about octocoral diversity of the western Gulf of Mexico? Benthic Ecology Meeting.

5. Easton**, E.E., D. Hicks**, C. Payliska (2019). Revelations from mitogenome studies of western Gulf of Mexico octocorals. International Deep-Sea Coral Symposium.

6. McLaughlin**, R., P. Gonzalez Diaz, et al. (2019). The Student Workshop on International Marine and Coastal Management (SWIMM) Results From the 2017 and 2018 Programs at Caguanes National Park in Northern-Central Cuba," XII Congreso de Educacion Ambiental Para el Desarrollo Sostenible,

7. Montagna**, P.A. (2019). Importance of Environmental Flows to Lavaca Bay. Lavaca Bay Foundation.

8. Montagna**, P.A. (2019). Focused Flows for Environmental Benefit. Texas Environmental Flows Funders Briefing, Meadows Foundation.

9. Montagna**, P.A. (2019). Importance of Freshwater Inflow to Lavaca Bay. Formosa Plastics.

10. Montagna**, P.A. (2019). Is Meiofauna better than Macrofauna for environmental assessment? 17th International Meiofauna Conference.

11. Montagna**, P.A. (2019). People, Climate, and the Importance of Freshwater Inflow to Estuaries. University of Texas, Research Experiences for Undergraduates.

12. Montagna**, P.A. (2019). Water resources and importance of environmental flows in Texas. Environmental Engineering Seminar Series, Texas A&M University – Kingsville.

13. Montagna**, P.A. and J. Trungale (2019). Assessment of the Relationship Between Freshwater Inflow and Biological Indicators in Lavaca Bay. Colorado-Lavaca Bay Basin Stakeholder Committee Meeting.

14. Montagna**, P.A.., C. Chaloupka, E. DelRosario*, A. Gordon, T. Palmer, and E. Turner (2019). Using Benthic Indicators to Determine Freshwater Inflow Requirements for Hydrological Restoration of a Salt Marsh. Benthic Ecology Meeting.

15. Montagna, P.A. (2019). Is Meiofauna better than Macrofauna for environmental assessment? 17th International Meiofauna Conference.

16. Najera, G., L. Contreras, A. Fierro-Cabo**, and C.E. Cintra-Buenrostro** (2019). Soil carbon fluxes in a mangrove-marsh-mudflat continuum of the lower Laguna Madre. UTRGV Engaged Scholar Symposium.

17. Ruiz J. and A. Fierro-Cabo** (2019). Is cold stratification needed for the germination of the native and symbolic Montezuma Cypress (Taxodium mucronatum) seeds?. UTRGV Engaged Scholar Symposium.

18. Salinas, S. and C.E. Cintra-Buenrostro** (2019). Effects of artificial substrates on the recruitment of juvenile fishes in the northwestern Gulf of Mexico. 8 th Annual Research Forum, UTRGV Marine Science Graduate Student Organization.

19. Temby**, O.* and Madrid*, C. (2019). Influence and Informal Ties in Public Management Networks: The Case of Disaster Planning in the Rio Grande Valley. Annual Conference of the New England Political Science Association.

20. Temby**, O., and A. Lima* (2019). Trust and Influence in the Gulf of Mexico's Fishery Public Management Network. Annual Conference of the New England Political Science Association.

21. Vasquez E., Fierro-Cabo** A. and J.A. McDonald (2019). Exploring nutrient manipulation as a tool for thorn forest restoration. UTRGV College of Sciences Annual Research Conference.

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: http://ccme.famu.edu

Other Products:
Publicly available datasets and products
1. Paudel, B., P.A. Montagna and L. Adams (2019). Water quality data from estuarine variable hydrologic flow regimes during frequent drought. Data in Brief 25:104178, doi: 10.1016/j.dib.2019.104178. https://www.sciencedirect.com/science/article/pii/S2352340919305323

Unpublished data and products (Developed for host offices during NERTOs)

2. Minor, K.: Flood extent maps for the Jackson, MS NWS office (JAN). Developed during NERTO "Geospatial mapping of flood extent for river basins in the Jackson, MS NWS forecast area", NOAA/NWS Jackson, MS. 2019

III. Participants in Award Performance

See Executive Summary and Appendix Table 1

Table 4: CCME Award Participants

Name	Most Senior Project Role	Project Hours Worked per Month
Larry Robinson, PhD	Director/Principal Investigator	10
Michael Abazinge, Ph.D.	Associate Director	10
Sharmini Pitter, Ph.D.	Assistant Director	160
Bernadette Kelley, Ph.D.	Education Expert	20
Sherry Wells	CCME Coordinator	160
Emily Jones, Ph.D.	Postdoctoral Research Associate	160
Steve Morey, Ph.D.	Distinguished Research Scientist	160
Kris Suchdeve	Data and Communication Manager	160
Richard Long, Ph.D.	Co-PI, Coastal Intelligence Co-Lead	26
Phyllis Gray-Ray, Ph.D.	Social Science Lead	42
Charles Jagoe, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Elijah Johnson, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Michael Martinez-Colon, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Hongmei Chi, Ph.D.	Big Data Lead	26
Richard McLaughlin, Ph.D.	Principal Investigator	29
David Yoskowitz, Ph.D.	Co-principal Investigator	21.7
Paul Montagna, Ph.D.	Co-principal Investigator	21.7
James Gibeaut, Ph.D.	Co-principal Investigator	21.7

Greg Stunz, Ph.D.	Co-principal Investigator	21.7
Jennifer Pollack, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Michael Wetz, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Mikell Smith	TAMUCC CCME Coordinator	139
J. Cho, Ph.D.	Co-principal Investigator	80 hrs/mo, one summer month budgeted, the rest is leveraged.
Corey Garza, Ph.D.	co-principal Investigator	40 hrs/mo, two weeks in summer, rest is leveraged.
Laura Good, Ph.D.	Education Liaison	20
Cheryl Logan, Ph.D.	CSUMB mentor	N/A, not budgeted under the award
Alison Haupt, Ph.D.	CSUMB mentor	N/A, not budgeted under the award
James Lindholm, Ph.D.	CSUMB mentor	N/A, not budgeted under the award
John Goeltz, Ph.D.	CSUMB mentor	N/A, not budgeted under the award
Ivano Aiello, Ph.D.	Moss Landing mentor	N/A, not budgeted under the award
Tim Turner, Ph.D.	Principal Investigator	5
Paul Tchounwou, Ph.D.	Co-Principal Investigator	1
Paulette Bridges	Program Manager	24
Ibrahim Farah, Ph.D.	Co-Investigator	Funded during the summer months
Fenxiang Han, Ph.D.	Co-Investigator	Funded during the summer months
Ranjani Kulawardhana, Ph.D.	Co-Investigator	Funded during the summer months
Brent Thoma, Ph.D.	Co-Investigator	Funded during the summer months
Carlos Cintra, Ph.D.	Co-Investigator	50
Owen Temby, Ph.D.	Co-Investigator	50
Erin Easton Ph.D.	Postdoctoral Research Associate	50
David Hicks Ph.D.	Principal Investigator	50
John Breier Ph.D.	Co-Investigator	Leveraged, not budgeted during time frame

Alejandro Fierro Ph.D.	Co-Investigator	50
Leticia Contreras	Education Liaison	64

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

What other organizations have been involved as partners?

Table 5: Federal and State Collaborative Partners

Type of Partner Organization: Federal/State	Organization Name:	Location	Partner's Contribution to CCME
Federal	NOAA National MPA Center	Monterey, CA	NERTO Host
Federal	Monterey Bay National Marine Sanctuary Office	Monterey, CA	NERTO Host
State/Federal	Elkhorn Slough National Estuarine Research Reserve	Elkhorn, CA	Host for thesis research
Independent Nonprofit	Woods Hole Oceanographic Institute	WHOI/ UTRGV	Leveraged Training and Research Opportunities for CCME student
State	Texas A&M University Corpus Christi	UTRGV	Leveraged Training and Research Opportunities for CCME student
Federal	NASA	AMES/ UTRGV	Leveraged Training and Research Opportunities for CCME student
State	Texas Parks and Wildlife	UTRGV	Leveraged Training and Research Opportunities for CCME student
Federal	NOAA Southeast Regional Office	St. Petersburg, FL	NERTO Host
Federal	NOAA AOML	Miami, FL	NERTO Host
Federal	NGA	Springfield, VA	Provide research funding, internship and job for CCME student
Federal	EPA	DC	Funding for the current CCME students research
State	FDEP	Tallahassee, FL	Oversighting of funded research by CCME students
State	FWC	Tallahassee, FL	Providing in-kind services and boat hours for CCME students

Have other collaborators or contacts been involved? Yes

Table 6: External Collaborative Partners

External Partner	CCME Lead Partner(s)	Description of Partnerships	Partner's Contribution to CCME
Mak Saito, Woods Hole Oceanographic Institution / Rod Johnson, Bermuda Institute of Ocean Science	John Breier CCME UTRGV	Collaborative research: High resolution nitrogen transformation processes at the Bermuda Atlantic Time series	Leveraged Training and Research Opportunities for CCME student
Texas State University	John Breier CCME UTRGV	LLM-PEM: A Predictive Ecological Model for the Lower Laguna Madre	Leveraged Training and Research Opportunities for CCME student
Dana Yoerger, Woods Hole Oceanographic Institution	John Breier CCME UTRGV	NSF collaborative project Mesobot: a robot for investigating the ocean interior	Leveraged Training and Research Opportunities for CCME student
Mak Saito, Woods Hole Oceanographic Institution	John Breier CCME UTRGV	Collaborative research: High resolution nitrogen transformation processes at the Bermuda Atlantic Timeseries	Leveraged Training and Research Opportunities for CCME student
Darlene Lim, NASA AMES/ Chris German Woods Hole Oceanographic Research Institution	John Breier CCME UTRGV	Systematic Underwater Biogeochemical Science and Exploration Analog	Leveraged Training and Research Opportunities for CCME student
Texas Parks & Wildlife Department	John Breier CCME UTRGV	Establishing a harmful algal bloom and plankton community composition observing time-series in the Lower Laguna Madre at Brazos Santiago Pass	Leveraged Training, Research Opportunities, and Research Infrastructure for CCME student
Charles Jacoby, St. Johns River Water Management District	J. Cho CCME B-CU	Oversight and provide advice for CCME student research projects	Thesis committee members, communication and sharing of data with CCME students
Duane De Freese, Indian River Lagoon National	J. Cho CCME B-CU	Reviewing and executing external grants for CCME	Funding agency liaison and director of the NEP program that provides current research funding

Estuary Program		student research	for CCME student research
Florida Department of Environmental Protection (FDEP)	J. Cho CCME B-CU	Funding, external collaborator, field guides for CCME students	Providing external partners of current funded projects; providing guides for field sites, design, and data. Providing funds
National Geospatial-Intelligence Agency	J. Cho CCME B-CU	Funding agency and provides internships to CCME students	Sponsored and hired CCME student's research, internship, and job
Cities of New Smyrna Beach, Edgewater, Oakhill, and South Daytona	J. Cho CCME B-CU	Collaborators and external partners on funded projects	Providing their properties (e.g. waterfront parks) for research, assist with outreach of the projects/workshops by CCME students
Ginger Adair, Volusia County Environmental Management	J. Cho CCME B-CU	Collaborators and external partners on funded projects	Providing in-kind fund and cash matches for projects by CCME students
Marine Discovery Center, Environmental Discovery Centers, and Marine Science Center	J. Cho CCME B-CU	Public education and outreach partners	Providing platforms for student engagement with the communities
Project H2O and Riverside Conservancy	J. Cho CCME B-CU	NGO consortia of varying organizations from local universities, governments, resource managers, public education, K-12 education	Providing volunteering hours/students
Annie Roddenberry, Florida Fish and Wildlife Conservation Commission (FWC)	J. Cho CCME B-CU	Collaborators and external partners on funded projects	Providing in-kind hours and boat times for projects by CCME students

Have NOAA collaborators or contacts been involved? Yes

Table 7: NOAA Collaborative Partners

NOAA Collaborator/Office/Program	CCME Faculty/Student Partner(s)	Description of Collaboration
Andrew DeVogelaere, Ph.D. / NMS	Miya Pavlock-McAuliffe / Lauren Parker	NERTO internship mentor
Charles Wahle, Ph.D. / National MPA Center	Taylor Eddy	NERTO internship mentor

Michelle Johnston, Ph.D./ Flower Garden Banks National Marine Sanctuary	David Hicks, Ph.D./ Graduate Student Rebekah Hernandez	NERTO internship mentor
Scott Large, Ph.D./ NEFSC	Owen Temby Ph.D./ Graduate Student Anthony Lima	NERTO internship mentor
Kim Penn/ National Ocean Service/ Office for Coastal Management	Owen Temby Ph.D./ Graduate Student Cristina Madrid	NERTO internship mentor
Christopher Kelble, Ph.D. / AOML	J. Cho/Philip Bellamy/Brianna Alanis	NERTO internship mentor/thesis committee
Gregory Dusek, Ph.D.	Craig Tinus/Shan Guruvadoo	NERTO internship mentor/thesis committee
Bill Arnold, Ph.D. / NOAA Fisheries SE Regional Office	J. Cho/Mallory Brooks	NERTO internship mentor
Cheryl Woodley, Ph.D. / NCCOS Charlesgon	Michael Martinez-Colon/Grad Student Angelique Rosa-Marin/Grad Student Margarette Bayron-Arcelay	NERTO internship mentor
Leslie Craig / NOAA Fisheries SE Regional Office	Samuel Mwenda	NERTO internship mentor
Mary Culver, Ph.D. / Office of Coastal Survey	Diana Del Angel	NERTO internship mentor
Ashok Deshpande / NEFSC Sandy Hook	Nigel Lascelles / Julian Venable	NERTO internship mentor
Jinnifer Doerr / SEFSC Galveston	Dr. Emily Jones (postdoc) / Grad Student Javier Navarro	NERTO internship mentor / Postdoctoral Mentor
Chad Entremont, Ph.D./ NWS Jackson, MS	Keenasha Minor	NERTO internship mentor
Trey Flowers, Ph.D. / Office of Water Prediction	Elizabeth Del Rosario	NERTO internship mentor
John Jacobs, Ph.D. / NCCOS Oxford Lab	Prian Vidal	NERTO internship mentor
Randall Kosaki, Ph.D. / Papahānaumokuākea Marine National Monument	Patricia Cockett	NERTO internship mentor

Steve Lonhart, Ph.D. / ONMS	Alexandra Thomsen	NERTO internship mentor
Thomas Oliver, Ph.D. / Pacific Islands Fisheries Science Center	Caroline Rodriguez	NERTO internship mentor
Mark Rowe, Ph.D. / GLERL	Andrea Pugh-Kelly	NERTO internship mentor
Joe Serafy, Ph.D. / SEFSC	Elizabeth Murphy	NERTO internship mentor
Eric Weissberger, Ph.D. / Office of Habitat Conservation	Meghan Martinez	NERTO internship mentor
Peter Etnoyer, Ph.D. / NCCOS Charleston Lab	Dr. Erin Easton	Postdoctoral Mentor

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 85 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 social sciences.

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. Individual Student Development Plans were assessed with CCME Scholars at the end of the Spring and Summer 2019 semesters.

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

CSUMB purchased a drone for scientific research during this period. This will enhance capacity to conduct research at that institution, and has fostered new collaboration for remote sensing studies with SWFSC.

NOAA CCME Social Science Lead Dr. Phyllis Gray-Ray submitted a proposal for an Environmental Sociology track of the Sociology B.Sc. degree at Florida A&M University. Dr. Gray-Ray is currently teaching the inaugural introductory course for the proposed degree, SYA3931 Honors Seminar I: Introduction to Environmental Sociology, with twelve non-CSC supported students enrolled.

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?
The CCME Data, Information, and Communication Manager supports this function. NOAA CCME team members utilize sophisticated tracking tools to support data collection in keeping with the implementation of the award. Center Management and Institutional PIs also work closely with our external evaluator for quality assessment and quality control of more extensive data points associated with award activities to track how we are meeting our goals and objectives.

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 transitioned into operations, applications and commercialization 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.

CCME students published five journal articles this reporting period and 2 theses. Faculty published four articles. There were 8 student presentations and 21 faculty presentations at conferences, workshops and meetings. All of these publications and presentations acknowledged CCME. The NOAA CCME website has been developed to feature research developments and disseminate research results within one year of data collection.

NOAA CCME Center Director Dr. Larry Robinson traveled to NOAA Headquarters in Silver Spring, MD to participate in the Center Champions Working Group (CCWG) meeting with CSC Directors, NOAA EPP/MSI and NOAA Leadership on March 12, 2019.

NOAA CCME management, faculty, and students have 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 which occurred on April 2, 2019.

VI. Changes / Challenges

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

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

1. **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 September 30, 2019 in compliance with the special award conditions.

2. **Evaluation Plan for Coastal and Marine Ecosystems Cooperative Science Center See Appendix C**
3. **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. An additional revised Implementation Plan that included the addendum was submitted to Grants Online (File ID: 2650452) on June 15, 2018. Further revisions have occurred. The current Center Implementation Plan is also available publically at http://ccme.famu.edu.

4. **EPP/MSI CSC Substantial Involvement and Collaborative Engagement**

CCME, working with NOAA EPP, is convening a session, "Education Partnerships in Coastal and Marine Science" at the 2019 CERF Biennial Conference to feature NOAA Cooperative Science Centers and their collective impact on the NOAA-mission workforce.

CCME is collaborating with the other CSCs in planning the 10th Biennial EPP/MSI Forum.

5. **EPP/MSI Direct Student Support, Post-Doctoral Program and Pre-Publication During the reporting**

CCME engages frequently with the NOAA EPP management team through email correspondence and conference calls. The EPP Supervisor Ms. Jacqueline Rousseau, EPP CSCs Program Manager Dr. Audrey Trotman, and co-Technical Monitors Dr. Steve Thur (NOS) and Dr. Chris Kelble (OAR) participate in monthly NOAA CCME calls with the NOAA CCME Center Management Team and Co-PIs to discuss progress updates and upcoming events. In addition to reviewing internship opportunities, the EPP management team has also been substantially engaged in the planning of the NOAA EPP/MSI Tenth Biennial Education and Science Forum including an on-site planning meeting which took place from June 19-20, 2019 at Florida A&M University. This is the first of three NOAA EPP/MSI visits to the CCME lead institution as part of the special award conditions regarding forum planning.

Post-Doctoral Program -

NOAA CCME Postdoctoral Research Associate Dr. Emily Jones began working with her NOAA mentor, Jennifer Doerr (SEFSC Galveston). Working with her mentor, she developed her postdoctoral research and mentorship plan and submitted it for review by the EPP Management Team and subsequent revisions (at the time of this report, the internship plan is submitted to Grants Online).
During this reporting period, NOAA CCME Postdoctoral Research Associate Dr. Erin Easton continued her internship with Dr. Peter Etnoyer (NCCOS Charleston).

NERTO and Student Internships with NOAA – See Appendix Table 1

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

For the current reporting period the Center External Evaluator has received $45,000 in support.

2. NOAA Environmental Data and Information

Currently, there are no collected data nor information that have been transferred to a publicly accessible data archive center. 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.

3. 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.

4. 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 – 08/31/2019 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:

1. **Total Number of EPP-funded post-secondary students from underrepresented minority communities** who are trained 61 and graduate 4 in NOAA-mission sciences.
2. **Total number of EPP-funded post-secondary students** who are trained 69 and graduate 5 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 1, 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 3 CCME plans to recruit nine transfer, 18 Master's, and two PhD students.

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

Total leveraged funding for reporting period: $2,193,197

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.

Please see Executive summary and Products of Award.

5.1 Education and Training

Please refer to the Evaluation Plan in Appendix C and the Executive Summary for updates on the following:

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.

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.
- 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.

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.

- 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).

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.

- 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.
- 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.

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.

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

Outputs

- Number of best practices that are measurable, scalable and transferable.
- 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.

Current tools in development:

Angelique Rosa Marin, NOAA CCME Graduate Scholar FAMU and her advisor, Michael Colon-Martinez are working on a bioindicator index which may be implemented by resource managers at the JBNERR.

NOAA CCME UTRGV faculty member Dr. Chip Breier, and collaborators are currently developing and testing AUV and ROV based biochemical and 'omic' sampling tools. We will be reporting on the status of these tools this year and pathways for making use of them

NOAA CCME Distinguished Research Scientist Dr. Steve Morey, and collaborators are developing new global coastal upwelling index databases from satellite-derived winds. This is on-going NASA-funded work, and website is functional now (http://coaps.fsu.edu/products-services/data/upwelling), but will be updated with ongoing modifications. I will also be working on new methodologies for upwelling indices (using multiple variables), and these data products will be served through the website as they are developed.

Appendix A: Summary Tables

Appendix Table 1: NOAA CCME Scholars

	CCME Scholar	Degree Level	Cohort	Faculty Advisor(s)	Synopsis Title	Synopsis Presented	Expected NERTO Participation Dates	NOAA/NERTO Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest	NOAA Mi Aligned Re Project Titl determin collaboratio NOAA me
1	Aaliyah Brown	B	3	Richard Long	-	-	-	-	–
2	Abraham DaSilvio	M	2	J. Cho	Assessment of Storm-water Pollution within a Coastal Urban Canal Basin: A Case Study of Nova-Reed Canal Basin along the Halifax River Estuary, Florida	Y	Fall 2019/Spring 2020	AOML Miami, FL	To be deve
3	Alexandra Shien-li Thomsen	M	3	Arlene Haffa	Evaluating indicators of and factors contributing to restoration success in a large-scale experiment	Y	In progress	Dr. Steve Lonhart, ONMS	Exploring th foraminifer bioassay orga coral re environmer CSC Stu
4	Alexis Hamilton	B	1	Richard Long	-	-	-	-	To be deve
5	Alexis Shokere	B	1	Michael Abazinge	-	-	-	-	To be deve
6	Andrea Pugh	D	2	Steve Morey	Pathways of PFAS in the Great Lakes from Sources to Water Intakes and Human Consumption	Y	COMPLETED: Summer 2019	Dr. Mark Rowe, GLERL	To be deve
7	Andria Miller	B	3	Brent Thoma	-	-	-	-	–
8	Angelique Rosa-Marin	M	1	Michael Martinez-Colon	Implementation of the FORAM Index (FI) in coral reefs from Jobos Bay at Puerto Rico	Y	Fall 2019	Dr. Cheryl Woodley, Research Microbiologist, NOS	–
9	Anthony Lima	M	1	Owen Temby	Inter-agency Cooperation, Policy, and Management of the Gulf of Mexico Fishery	Y	COMPLETED: June 4th - August, Summer 2018	Dr. Scott Large, Northeast Fisheries Science Center, NMFS	–
10	Anthony Lima	D	1	Dr. Richard McLaughlin	Under development, due May 1, 2019	N	Summer 2021 or 2022 (tentative)	Seeking a NOAA mentor	–
11	Ariana Uwaibi	D	2	Richard Long	In development	N	Spring 2020	Seeking - CCME will reach out to potential contacts	To be devel
12	Ashley Lacey	D	3	Larry Robinson	-	-	-	-	In Developm water qua
13	Brian Coogan	B	3		-	-	-	-	–
14	Brianna Alanis	B	1		-	-	-	-	Chemic Characteriza Micropla Polymers fo Graduate S
15	Brianna Alanis	M	2	John Breier	Using primary productivity proxies as ecosystem health metrics	Y	COMPLETED: Spring 2019	Dr. Chris Kelble, AOML	–
16	Carlos Ray	B	3	Michael Abazinge	-	-	-	-	Human use NOAA Ha Estuarine Re Reserve (NE quantify ecosystem s

									values with re recreationa
17	Caroline Rodriguez	M	3	Cheryl Logan	Physiological responses of corals to temperature stress	Y	Fall 2019	SSIO in development with Dr. Thomas Oliver, Pacific Islands Fisheries Science Center	To be deve
18	Cassandra Rodriguez	B	1	David Hicks	-	-	-	-	To be deve
19	Cristina Madrid	M	1	Dr. Owen Temby	Disaster Coordination in the Rio Grande Valley	Y	Summer 2018 (completed)	Kim Penn, Silver Spring, MD at NOAA facility and College Park, MD at the University of Maryland College Park	Rip Current Validati
20	Daniel Flores	B	3	Alejandro Fierro Cabo	-	-	-	-	Investigating of changing range and ti U.S. harb
21	Daryin Medley	M	3	Michael Abazinge	-	-	-	-	–
22	David Lecusay	B	1	Carlos Cintra	-	-	-	-	–
23	Devin Comba	M	3	Jennifer Pollack	-	-	-	-	–
24	Devon Preyer	B	3	Steve Moore	-	-	-	-	To be deve
25	Diana Del Angel	D	1	David Yoskowitz	Assessment of Salt Marsh Ecosystem Services in the US Gulf of Mexico	Y	Completed: Spring 2019	Dr.Mary Culver; NOAA Office of Coastal Survey	To be deve
26	Elizabeth del Rosario	D	1	Richard McLaughlin	Environmental Flows Management Strategy for the Coastal Zone in Texas	Y	Completed: Summer 2019	Dr. Trey Flowers, P.E.Director, Analysis and Prediction DivisionNOAA/NWS/NWC/Office of Water Prediction	Evaluating in of regula complexi understand th complia
27									–
28	Elizabeth Murphy	M	1	Carlos Cintra	Tracking nitrogen transfer through Black Mangrove (Avicennia germinans) communities	Y	Completed Spring 2019	Dr. Joe Serafy (NOAA/NMFS/SEFSC) in Miami, FL	–
29	Emily Chui	B	1	Alison Haupt	-	-	-	-	–
30	Gabrielle Figueroa	T	2	Michael Martinez-Colon and Emily Jones	-	-	-	-	To be deve
31	Gabrielle Watkins	B	3	Juan Calderon	-	-	-	-	To be deve
32	Geramy Perriman	B	1	Brent Thoma	-	-	-	-	To be deve
33	Harrison R. Watson	B	1	Brent Thoma	-	-	-	-	–
34	Jada Grant	B	1	Brent Thoma	-	-	-	-	–
35	Jaime Lopez	B	1	Owen Temby	-	-	-	-	–
36	Javier Navarro	M	1	Alejandro Fierro Cabo	Analysis of the facilitative relationship betweenBatis maritimaandAvicennia germinansseedlings as mangrove restoration strategy	Y	In Progress	Jennifer Doerr, SE SEFSC	To be deve

37	Jessica Webb	B	1	Brent Thoma	-	-	-	-	-
38	Jonathan Breaux	T	1	Brent Thoma	-	-	-	-	-
39	Jordan Roberts	B	1	Michael Abazinge	-	-	-	-	To be deve
40	Joshua Rigo	M	3	Hongmei Chi	-	-	-	-	-
41	Julian Venable	D	2	Ibrahim Farah/Brent Thoma	Densities and potential impacts of microplastics in Grand Bay National Estuarine Research Reserve	N	Completed: Summer 2019	Ashok Deshpande NEFSC Habitat Ecology Branch NMFS Sandy Hook, NJ	To be deve
42	Katia Sanchez	B	3	Owen Temby	-	-	-	-	To be deve
43	Keenasha Minor	M	1	Fengxiang Han	Analysis of Naturally Occurring Radionuclides in the Northern Gulf of Mexico	N	Completed: Summer 2019	Chad Entremont, NWS	Meso-photic the Montere National M Sanctua
44	Kelsey Martin	D	2	Greg Stunz	Characterizing large predatory fish across Gulf of Mexico habitat	Y	Spring 2021	Matthew Campbell National Marine Fisheries Service Pascagoula, MS	-
45	Kennedy Jones	B	2	Ranjani Kulawardhana	-	-	-	-	Data need planning assessment o (Crassos virginica) res in the Northe of Mexico ur Deepwater H Natural Res Damage Ass (NRDA
46	Lauren Parker	M	1	James Lindholm	The ecology of organisms on the “lost reefs” of the MBNMS: diver-held video surveys from 20-40 m water depth.	Y	Completed Fall 2018	Dr. Andrew Devogelaere, Research Coordinator, Monterey Bay NMS	-
47	Lily Walker	D	1	Michael Wetz	Dissolved Oxygen Dynamics in Texas Estuaries	Y	Summer 2020	Dr. Suzanne Bricker, Physical Scientist and Manager of NOAA's National Estuarine Eutrophication Assessment, NCCOS, Cooperative Oxford Laboratory	-
48	Liyah Smith	T	1	Brent Thoma	-	-	-	-	East Flower Bank Photo Coral Spe Identificati Historical Cover Analy CSC Grad Studer
49	Liyah Smith	M	3	Richard Long	-	-	-	-	-
50	Mallory Brooks	M	2	Dr. Hyun Jung (J.) Cho	Evaluating the effectiveness of restored shorelines in mitigating non-point source	Y	Summer 2018 (completed)	Dr. Bill Arnold, NOAA Fisheries	-

					pollution and climate impacts in the Mosquito Lagoon, Florida, USA			Southeast Regional Office	
51	Margarette Bayron-Arcelay	D	2	Michael Martinez-Colon	It takes two to tango: protist and bacteria as bioindicators of estuarine health in FL and TX	Y	2020 or 2021	Dr. Cheryl Woodley, Research Microbiologist, NOS	Meta-analy West Coast Performa
52	Mariana León Pérez	D	3	Dr. James Gibeaut	Vulnerability of Coastal Social-Ecological Systems to Sargassum Beaching Events	Y	Summer 2020 (tentative)	pending	To be deve
53	Meghan Martinez	M	1	Jennifer Pollack	Influence of oyster reef restoration on benthic infauna and reef-associated macrofauna	Y	Completed: Summer 2019 (May 28, 2019 – August 20, 2019)	NOAA Mentor: Dionne Hoskins-Brown NERTO mentor: Eric Weissberger, Ph.D., NOAA National Marine Fisheries Service, Office of Habitat Conservation, Restoration Center, Silver Spring MD	Implemer Ecosystem- Managemen U.S. Carib
54	Melissa Meredith	B	1	Cheryl Logan	-	-	-	-	pendin
55	Miracle Vance	B	3		-	-	-	-	Pendin
56	Miya Pavlock McAuliffe	M	3	Dr. Rikk Kvitek (CSUMB) & Dr. Tom Connolly (Moss Landing Marine Laboratories)	Quantifying Sediment Transport Along a Rocky Embayed Coastline: The Southern Monterey Bay, CA	Y	Completed: Summer 2019	Dr. Andrew Devogelaere, Research Coordinator, Monterey Bay	Gray, Gree Cultur Infrastruc Solutions to I Coastal Res For CSC S
57	Natalie Vaughn	B	3	John Olson	-	-	-	-	Geospatial collection visualizati enhance res manager/sc collaboratio EPP CSC s
58	Nigel Lascelles	M	1	Charles Jagoe	Oysters as sentinels of microplastic pollution	N	COMPLETED : June 1 - August 31, Summer 2018	Dr. Ashok Deshpande, Sandy Hook, Northeast Fisheries Science Center	Identification effective sal restorati opportunitie the South A coast
59	Olivia Boisen	B	1	John Goeltz	-	-	-	-	
60	Patricia Cockett	D	1	Paul Montagna	Landscape Connection to Coastal Marine Systems: The Ahupua'a Concept	Y	In Progress	Dr. Randall Kosaki, Papahānaumokuā kea Marine National Monument	
61	Philip Bellamy	M	1	J. Cho	-	-	-	-	
62	Prian Vidal	M	1	Charles Jagoe and Elijah Johnson	Nitrogen sequestration associated with oyster aquaculture in the Oyster Bay, Aquaculture Use Zone, Wakulla Co, FL	N	In progress	Dr. Suzanne Bricker, Physical Scientist and Manager of NOAA's National Estuarine Eutrophication Assessment,	

								NCCOS, Cooperative Oxford Laboratory	
63	Queriah Simpson	M	3	Steve Morey and Richard Long	In development	N	Completed	John Christensen, NCCOS, NOS	
64	Ra'Teema Etienne (Stanley)	M	2	Hongmei Chi	Predict Florida Beach rip current via Data Analytics Techniques	N	Completed: Summer 2019	Mike Churma and Dr. Jung-Sum Im, Meteorological Development LaboratoryOffice of Science and Technology IntegrationNWS	
65	Rebekah Hernandez	M	1	David Hicks	Assessing long-term benthic community dynamics at the Flower Garden Banks National Marine Sanctuary	Y	COMPLETED: June 2018 - August 2018	NERTO Mentor: Dr. Michelle Johnston, Research Marine Biologist, Flower Garden Banks National Marine Sanctuary; NOAA mentor: Dr. Emma Hickerson, Flower Garden Banks National Marine Sanctuary	
66	Rhamira Corbett	B	3	Michael Abazinge	-	-	-	-	
67	Riley Young	B	3	Corey Garza	-	-	-	-	
68	Robert McKinzie	B	B	Hyun Cho	-	-	-	-	
69	Ryan Rubino	M	3	Joe Fox	-	-	-	-	
70	Samuel Mwenda	M	1	Dr. Hyun Jung (J.) Cho	Assessing Treatment Wetland Efficacy and Public Education in Stormwater Treatment Utilizing Native Wetland Plants	Y	Completed: Summer 2019	Leslie Craig and Dr. Lisa Vandiver, NOAA Fisheries Southeast Regional Office	
71	Sandra Leal	B	3	Carlos Cintra	-	-	-	-	
72	Shalalia Duke	B		Sarah Krejci					
73	Shan Guruvadoo	M	1	Craig Tinus	Investigating causes of changing tidal range and timing in U.S. harbors	Y	COMPLETED: Start Date: August 14, 2017 End Date: November 3, 2018; Completed 12 weeks- Fall 2017	Drs. Gregory Dusek; Chris Zervas (CO-OPS); Organization - Jena Kent	
74	Shaquila Rolle	B	1	Richard Long	-	-	-	-	
75	Shelby Bauer	B	1	Alejandro Fierro Cabo	-	-	-	-	
76	Shelby Windham	B	1	Brent Thoma	-	-	-	-	

77	Shirlay Alexander	B	3	Brent Thoma	N/A	N/A	-	-	
78	Summer Martinez	T	3	Richard Long	-	-	-	-	
79	Tayler McKinnon	B	1		-	-	-	-	
80	Taylor Eddy	M	1	Corey Garza	Multiscale habitat use and effects of MPAs on California spiny lobster success	Yes	Completed Fall 2018	Dr. Charlie Wahle, Senior Scientist, NOAA National Marine Protected Areas Center	
81	Terrius Bruce	T	2	Steve Morey	-	-	-	-	
82	Victoria Salinas	M	3	David Hicks	Growth and Reproduction studies of Black Corals (antipatharians): South Texas	N	Anticipated Spring 2020	Seeking - NOAA engagement needed	
83	Willis Lyons	D	2	Michael Abazinge	-	-	-	-	

Appendix Table 2: Student Competencies

Coastal Resilience	*Coastal Intelligence*	*Place-Based Conserv*
1. The natural and nature-based infrastructure that address the impact of extreme weather on coastal ecosystems and communities.	1. The elements of sea-level rise observation networks and their relationship to sea-level rise projections.	1. The policies and co decision-making tools based conservation.
2. The community-based approaches for the preservation, fortification, and enhancement of natural and nature-based coastal infrastructure.	2. The leading stressors on ecosystem processes and their relationship to ecosystem health.	2. The relationship be applied, and social sc policies as it pertains management.
3. The models for community-based approaches for assessing the vulnerabilities and value of proposed solutions relating to the impact of extreme weather and sea-level rise on coastal ecosystems and communities.	3. Archived, existing, and new data streams that support ecosystems dynamics and research.	3. Best practices for e stakeholders in addre based concerns.
4. The tools used to study natural and nature-based infrastructure that mitigate the impact of extreme weather and sea-level rise on coastal communities and ecosystems.	4. Widely-used databases and decision-support tools that address coastal hazards.	4. Broadly-used ecosy tools and their use in conservation efforts.
5. Integrating models and practices and other decision-making tools for ecosystem-based management.	5. Best practices for ecosystem assessment and restoration.	5. The tools used to b with demand for coas utilization and econo

6. Advocating for the accountability of social science in planning and budgeting to enhance coastal community projects.	6. Demonstrate the use of communication approaches to deliver more effective warnings about coastal resources and coastal hazards.	6. Understand socio-e
_	7. Evaluate a select suite of products and services to confirm the integration and effective use of social science into coastal intelligence research.	7. Engage community

Appendix B: Advisory Boards

1. Science Advisory Council Members

2. Community Stakeholder Advisory Board

Appendix B1: NOAA CCME Science Advisory Council Members

Chair: Dr. James Pinckney, Director
Belle W. Baruch Institute for Marine and Coastal Sciences
Marine Ecologist at the University of South Carolina

Dr. Jay Pinckney is the Director of the Baruch Institute for Marine and Coastal Sciences at the University of South Carolina. He is also a Professor in the Department of Biological Sciences and the Marine Science Program at USC in Columbia, SC. Dr. Pinckney is a marine ecologist who studies how marine ecosystems work, especially in terms of how they process energy derived from microscopic plants (phytoplankton and microalgae). Most of his work is conducted in estuarine and coastal waters, including the Gulf of Mexico, San Salvador Island in the Bahamas, North Inlet Estuary on the South Carolina coast, and Galveston Bay, Texas.

Council Members

Lisa Gonzalez, President and Chief Executive Officer
Houston Advanced Research Center (HARC)

Lisa Gonzalez is the President and Chief Executive Officer of the Houston Advanced Research Center (HARC). She is responsible for the strategic direction of HARC and its research programs which are designed to facilitate sustainable management of air, energy and water resources. She served as Vice President and Chief Operating Officer of HARC from 2012-2016, overseeing the implementation of HARC's 5-year strategic plan, development of HARC's communication strategy, a reorganization of administrative operations and the design and construction of HARC's new green headquarters. In addition to leading HARC, Ms. Gonzalez is active in research focused on the analysis and dissemination of data concerning the health and productivity of Texas Gulf Coast bays, estuaries and watersheds. Her expertise includes analysis of coastal monitoring data sets and the development of indicators and outreach products describing coastal fish and wildlife populations, invasive species, coastal habitats, water quality, freshwater inflows, seafood safety and climate change.

Jenn Eckerle, Deputy Director, Ocean Protection Council

Jenn Eckerle joined OPC in December 2016. As OPC's Deputy Director, she is responsible for supervising staff and helping set the strategic priorities for coast and ocean policy in California. Before joining OPC, Jenn spent eight years as an ocean policy analyst for the Natural Resources Defense Council, where she conducted technical analysis and developed policy recommendations to advance ocean conservation. Prior to that, she was a coastal program analyst for the California Coastal Commission and the San Francisco Bay Conservation and

Development Commission. Jenn earned an M.S. in Marine Biology from the Florida Institute of Technology and a B.S. in Biology from the University of Vermont.

Dr. Brean Duncan, Ecological Program Integrated Mission Support Services,

Dr. Brean Duncan is a Geographer/Spatial Ecologist with the Ecological Program at NASA's John F. Kennedy Space Center, Florida. His interests include investigating how anthropogenic influences alter natural terrestrial systems and their maintenance processes with a focus on mimicking the results of natural maintenance processes through land management application. This includes establishing baseline knowledge of resource abundance/distribution/pattern to guide effective land management practices for conserving/maintaining native fire dependent species habitats and favorable demography for their survival. He has considerable experience using remote sensing, geographic information system (GIS), and global positioning system (GPS) technology to design, implement, and automate spatial databases for ecological modeling and spatial analysis. This includes vegetation, landuse/landcover, habitat, fuels, fire event and fire regime mapping/modeling.

NOAA Employee Members

Dr. LaToya Myles, Deputy Director, NOAA Air Resources Laboratory, Atmospheric Turbulence and Diffusion Division, Oak Ridge, TN,

Dr. Latoya Myles' research is interdisciplinary, involving both atmospheric chemistry and environmental science. She measures the exchange (i.e., emission and deposition) of gases and particles between the air and land in coastal and agricultural ecosystems. Many of her measurement studies focus on ammonia (NH3), the most abundant basic gas in the atmosphere and an important part of the biogeochemical cycle. The data collected from these studies is used to improve estimates of air pollution and provide information about the potential impact on human health and the environment.

Dr. Charles Wahle, Senior Scientist, NOAA National Marine Protected Areas Center,

Dr. Charlie Wahle serves as Senior Scientist in NOAA's National Marine Protected Areas Center. He is a marine ecologist now working at the science to policy interface of ocean conservation. Recently, this work has focused largely on understanding patterns and implications of human uses of the oceans, particularly ocean recreation in marine protected areas. Between 2010-2012, he served on a detail to help create and implement the US National Ocean Policy. Before joining the MPA Center in 2000, Dr. Wahle led NOAA's national science, education and

policy programs for the National Marine Sanctuaries and National Estuarine Research Reserves programs, and represented NOAA and DOC on several major interagency conservation initiatives.

Appendix B2: Community Stakeholder Advisory Board Members

CCME Community Stakeholder Advisory Board Members
Dr. Charles Jacoby
Supervising Environmental Scientist
Water Resources
St. Johns River Management District

Dr. Ayesha Gray, Director
Grand Bay National Estuarine Research Reserve

Mr. Jace Tunnell, Reserve Director
Mission-Aransas National Estuarine Research Reserve
The University of Texas Marine Science Institute
Estuarine Research Center

Dr. Andrew DeVogelaere, Research Coordinator
Monterey Bay National Marine Sanctuary

Ms. Jenna Harper, Manager
Apalachicola National Estuarine Research Reserve
Environmental Education and Training Center

Appendix C: Evaluation Summary

Overview

The External Evaluator continued to work with Project Director and CMT to advance assessment and evaluation work of CCME. The Evaluator participated in monthly conference calls conducted by the Project Director to share evaluation updates with the Co-PIs. Evaluator made two (2) visits to the FAMU campus to meet with the CMT and to discuss evaluation efforts. The Evaluator conferred with the CMT regarding performance indicators for Year 2. The CMT is working to finalize the Year 2 Evaluation Data Template that the Evaluator will use to complete the Year 2 Evaluation Report.

In August of 2018, the Evaluator held an evaluation conference call with Project Director and Co-PIs to review the Evaluation Performance Indicator Scoring Matrix (Evaluation Appendix 1). During the call the Evaluator reviewed the Performance Indicator Scoring Matrix for Year 2. The team also discussed the scoring weights assigned to each goal for Project Years 1-5 as an integral component of the overall evaluation scheme (below).

	Year 1	Year 2	Year 3	Year 4	Year 5
Goa1 1	**.30**	**.25**	**.30**	**.25**	**.30**
Recruitment	(.15)	(.10)	(.10)	(.05)	(.05)
Training	(.15)	(.15)	(.10)	(.10)	(.05)
Completion	N/A	N/A	(.10)	(.10)	(.20)
Goal 2 (Research)	**.10**	**.20**	**.20**	**.25**	**.20**
Goal 3 (NOAA Big Data)	**.10**	**.15**	**.20**	**.25**	**.20**
Key Impact Metrics	**.50**	**.40**	**.30**	**.25**	**.30**

The Evaluator will meet with the Project Director and CMT to refine the Year 3 Evaluation Plan and to determine the key steps in preparing for the Year 4 evaluation that will be conducted under the auspices of NOAA EPP.

The Evaluator and CMT continues to advance the CCME assessment and evaluation efforts consistent with CCME Evaluation Timeline (Evaluation Appendix 2).

EVALUATION APPENDIX 1: CCME External Evaluation Key Performance Indicator Framework

CCME Goal 1 - Recruit, train, and graduate underrepresented minority groups, with the competencies and skills that support NOA workforce goals.						
Recruitment Performance Indicator	**Strategic Plan Performance Objectives**		**CCME Project Goals**	**Measure Type**	**Baselines**	**Targ**
	Objective	**Number**				
Number of CCME underrepresented minority undergraduate students enrolled in NOAA-mission related degree programs at partner institutions	Relationships/Partnerships	1.1	1a	Summative		
Number of CCME underrepresented minority graduate students enrolled in NOAA-mission related degree programs at partner institutions	Relationships/Partnerships	1.1	1a	Summative		
Number of total budgeted underrepresented minority Post Docs recruited into the CCME	Relationships/Partnerships	1.1	1a	Summative		
Total number of CCME students recruited and enrolled in NOAA mission-related degree programs at partner institutions	Relationships/Partnerships	1.1	1a	Summative		
Mean Effectiveness Score (Recruitment) =						
Training Performance Indicator	**Strategic Plan Performance Objectives**		**CCME Project Goals**	**Measure Type**	**Baselines**	**Targ**
	Objective	**Number**				
Percentage of total CCME students receiving center wide core competency (CWCC) short course certification	Education and Outreach	1.2	1c	Summative		
Number of CCME students who have participated in experiential opportunities at a NOAA Lab, office, or facility (i.e., NERTO or SSIO)	Education and Outreach	1.1	1a	Summative		
Number of participants of the GIS Activities	Educational Training	1.1	3b	Summative		
Percentage of students with the required GPA in NOAA related degree programs at partner institutions	Educational Training	2.5	1a	Summative		
Percentage of students demonstrating learning gains in the competencies related to the CCME Focus Areas	Education and Outreach	1.2	1.c	Summative		
Percentage of students demonstrating learning gains in competencies related to social science integration	Education and Outreach	1.2	2a,b,c	Summative		
Number of invited or refereed presentations or publications by CCME scientists	Educational Training	1.1	1a	Summative		
Number of NOAA scientists and experts working in collaboration with CCME students and faculty	Research	3.1	1.d	Summative		

Mean Effectiveness Score (Training) =						
Program Completion Performance Indicator	**Strategic Plan Performance Objectives**		**CCME Project Goals**	**Measure Type**	**Baselines**	**Targ**
	Objective	**Number**				
Number of CCME underrepresented minority students accepted into postdoctoral level programs	Educational Training	2.3	1b	Summative		
Number of underrepresented minority students who graduate in NOAA-mission sciences annually	Educational Training	2.2	1a	Summative		
Number of CCME students hired by NOAA, NOAA contractors, and other natural resource and science agencies at the federal, state and local levels	Educational Training	2.4	1b	Summative		
Mean Effectiveness Score (Program Completion) =						
Mean Effectiveness Score (Goal 1) =						
CCME Goal 2 - Conduct research leading to the development of management and communication tools that can be utilized to enhar communities and economies.						
Performance Indicator	**Strategic Plan Performance Objectives**		**CCME Project Goals**	**Measure Type**	**Baselines**	**Targ**
	Objective	**Number**				
Percentage of CCME students earning required quality rating on faculty-mentored research projects	Personnel	1.1	2a,b,c	Summative		
Number of NOAA scientists serving as research mentors and advisors for student research	Personnel	3.2	1a	Summative		
Number of total CCME scientists establishing research collaborations with NOAA specialists and scientists	Research	3.1	2a,b,c	Summative		
Number of CCME faculty and staff who publish their NOAA mission-related research findings in peer-reviewed journals	Educational Training	1.1	2a,b,c	Summative		
Number of CCME students who publish their NOAA mission-related research findings in peer-reviewed journals	Educational Training	1.1	2a,b,c	Summative		
Number of management and communication tools (models, datasets, etc.) developed in alignment to CCME sponsored research	Personnel	2.1	1a	Summative		
Number of citations referencing use of CCME developed tools	Personnel	1.1	2a,b,c	Summative		
Number of citations referencing CCME sponsored research or publications	Personnel	1.1	2a,b,c b	Summative		

Number of CCME students, staff, or faculty recognized nationally for NOAA-mission relevant research	Personnel	3.1	2a,b,c	Summative		
Total number of NOAA mission-related research projects conducted by CCME scientists	Personnel	3.1	2b	Summative		
Mean Effectiveness Score (Goal 2) =						
Goal 3- Develop competencies and skills in the utilization of new and existing "big data" archives in decision support tools that prom marine ecosystems.						
Performance Indicator	**Strategic Plan Performance Objectives**		**CCME Project Goals**	**Measure Type**	**Baselines**	**Targ**
	Objective	**Number**				
Number of student participating in the CCME Big Data Bootcamp	Personnel	2.1	3a	Summative		
Percentage of students demonstrating learning gains as a result of CCME training relative to the use of NOAA large data sets	Personnel	2.1	3a	Summative		
Number of CCME submissions of new data to enhance NOAA-relevant data sets	Personnel	2.3	3a	Summative		
Number of CCME sponsored research project that make use of NOAA large data sets	Personnel	2.1	3b	Summative		
Number of CCME sponsored authorized users of NOAA-related databases	Personnel	2.1	3b	Summative		
Number of NOAA scientists and managers engaged in CCME large data projects	Research	3.1	1.d	Summative		
Mean Effectiveness Score (Goal 3) =						
CCME Overall Impact Indicators						
Performance Indicator	**Strategic Plan Performance Objectives**		**CCME Project Goals**	**Measure Type**	**Baselines**	**Targ**
	Objective	**Number**				
Number of CCME-funded post-secondary students who are trained and graduate in NOAA mission-related sciences	Educational Training	2.2	1a	Summative		
Number of CCME-funded post-secondary underrepresented minority students who are trained and graduate in NOAA-mission sciences	Educational Training	2.2	1a	Summative		
Number of CCME graduates hired by NOAA, NOAA contractors, NOAA partners, or resource management agencies, or academia or as entrepreneurs	Educational Training	2.4	1b	Summative		

Number of CCME graduates who participate in and complete NOAA mission-related post-doctoral level programs	Educational Training	2.4	1b	Summative		
Number of scholarly publications (peer-reviewed, reports to community groups and coastal decision-makers) and presentations (scientific, agency, inter-agency, local)	Personnel	1.1	1b	Summative		
Funds leveraged with NOAA EPP award (including post-secondary support)	Research	2.1		Summative		
Total number of NOAA mission-related research projects conducted by CCME scientists	Personnel	3.1	2b	Summative		
Number of CCME research projects, theses, and dissertations that include human dimension components	Personnel	3.1	2a,b,c	Summative		
Number of CCME students that have research projects, theses, and dissertations committees that include social scientists	Personnel	3.1	2a,b,c	Summative		
Number of research collaborations with NOAA and CCME student, faculty, and staff	Research	3.1	2a	Summative		
Number of partnerships established and maintained in support of NOAA's mission	Research	3.2	2b	Summative		
Number of NOAA scientists and experts working in collaboration with CCME students and faculty	Research	3.1	1d	Summative		
Mean Effectiveness Score (CCME Overall Impact) =						
OVERALL MEAN EFFECTIVENESS SCORE =						

EVALUATION APPENDIX 2: CCME Evaluation Activity Timeline

Evaluation Activity		Project Year 1				Project Year 2				Project Year 3				Project Year 4				
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	C
Planning	CMT Evaluation Planning and Update Conference Call			X	X	X		X		X		X		X		X		X
	Review/Revise Logic Model			X						X								
	Review/Revise CCME Comprehensive Evaluation Plan			X						X								X
	Develop Focus Group Protocol				X								X					
	Draft Perception Surveys				X								X					
	Internal Evaluation Team Conference Call			X	X		X		X		X		X		X		X	
Site Visits	Review/Refine Site Visit Protocol			X	X													
	Site 1 Site Monitoring Report Due to Evaluator				X				X				X				X	
	Site 1 On-site Visit				X				X				X				X	
	Site 2 Site Monitoring Report Due to Evaluator				X				X				X				X	
	Site 2 On-site Visit				X				X				X				X	
	Site 3 Site Monitoring Report Due to Evaluator				X				X				X				X	
	Site 3 On-site Visit				X				X				X				X	
	Site 4 Site Monitoring Report Due to Evaluator					X					X				X			
	Site 4 On-site Visit					X					X				X			
	Site 5 Site Monitoring Report Due to Evaluator					X					X				X			
	Site 5 On-site Visit					X					X				X			
	Site 6 Site Monitoring Report Due to Evaluator					X					X				X			
	Site 6 On-site Visit					X					X				X			
Perception Data	Distribution of CCME Student Survey			X				X				X				X		
	Distribution of CCME Faculty/Staff Survey			X				X				X				X		
	Distribution of CCME Administrative Questionnaire					X				X				X				X
	Conduct CCME Student Focus Group Discussion				X				X				X				X	
	Conduct CCME Faculty Focus Group Discussion				X				X				X				X	
Reporting	CCME Mid-Year Status Report Due to Evaluator						X				X				X			
	Submission of Mid-Year Evaluation Report							X				X				X		
	CCME Annual Status Report Due to Evaluator				X				X				X				X	

	Submission of Annual Evaluation Report to CMT					X				X				X				
	2-Day Annual Evaluation Meeting with CMT and Lead PIs					X				X				X				
	Focus Area Progress Report Due to Evaluator						X						X					
	Submission of Interim 3rd-Year Evaluation Report														X			
	Submission of Summative 5th Year Evaluation Report																	

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