

NOAA CENTER FOR COASTAL AND MARINE ECOSYSTEMS (CCME)



Semi-Annual Performance Report for
Award Number NA16SEC4810009
Reporting Period: September 1, 2019 – February 29, 2019

Lead Institution - Florida A&M University

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Director and Principal Investigator

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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)

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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
NCCOS: National Centers for Coastal Ocean Science

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NERTO: NOAA Experiential Research & Training Opportunities

NMFS: National Marine Fisheries Service

NOAA: National Oceanic and Atmospheric Administration

NOS: NOAA's National Ocean Service

OAR: Oceanic and Atmospheric Research

SEFSC: Southeast Fisheries Science Center

URM: Underrepresented Minority

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 September 1, 2019 - February 29, 2019 for the National Oceanic and Atmospheric Administration's Center for Coastal and Marine Ecosystems (NOAA CCME). During this reporting period, NOAA CCME had 73 active students (81% from underrepresented minority – URM – communities, Appendix A Table 1), with a total of 97 students (pursuing 104 separate degrees) supported to date.

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

- During this reporting period, NOAA CCME graduated a total of 6 students (3 B.S. and 3 M.S.), 5 of these being from URM communities. To date, NOAA CCME has graduated 28 students (achieving 29 degrees - 20 Bachelor's and 9 Master's) with 24 of these students (25 degrees) from URM communities (Table 1a).
- Three of the NOAA CCME graduates from this reporting period are currently employed in NOAA-relevant STEM and social science fields (Appendix A Table 6). This brings the total number of NOAA CCME graduates or current scholars near completion who are employed in NOAA mission-relevant fields to ten students and one postdoc (note that one student has held two NOAA mission-relevant jobs). Many of the other previous NOAA CCME graduates are continuing in their studies.
 - Fall 2019 graduate Elizabeth Murphy (M.S. UTRGV) is working at the Department of Environmental Protection, DLR/Special Reclamation section with the state of West Virginia based out of Philippi, WV.
 - Fall 2019 graduate Brianna Alanis (M.S. UTRGV) is working at UTRGV as a Research Associate.
 - Fall 2019 graduate Taylor Eddy (B.S. CSUMB) is working with the U.S. Geological Survey.
- Seven NOAA CCME scholars are continuing their education within the Center, including Fall 2019 graduate Summer Martinez (B.S. FAMU), who is now a M.S. student at FAMU.
- Four NOAA CCME Graduate Scholars completed their NERTOs during this reporting period, bringing the total number of students completing NERTOs to date to 27.

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- NOAA CCME Postdoctoral Researcher Dr. Erin Easton completed her Postdoctoral NOAA internship under the supervision of her NOAA mentor Peter Etnoyer, Ph.D. at the NOAA NCCOS Charleston, SC Lab. Dr. Easton also finished her Postdoc with NOAA CCME in December 2019 and is now working as a Research Assistant Professor at UTRGV.
- During the reporting period Coastal Intelligence NOAA CCME Postdoctoral Researcher Dr. Emily Jones continued her Postdoctoral NOAA internship at NOAA SEFSC Galveston, TX under the supervision of her NOAA mentor Jennifer Doerr.
- Forty-three NOAA CCME scholars developed abstracts for presentations at the upcoming Tenth Biennial NOAA EPP/MSI Education and Science Forum. At this time, however, the Forum has been postponed from its originally planned dates of March 29-April 1, 2020 due to COVID-19 (see Section VI).

Table 1. Graduates of NOAA CCME

Graduates of NOAA CCME

	Name (Last, First)	Partner Institution	Degree	URM Community	Cohort	Graduation Date
Graduated Students from URM Communities						
1	Alanis, Briana	University of Texas Rio Grande Valley	M.S.	Hispanic	2	December 2019
2	Alanis, Brianna	University of Texas Rio Grande Valley	B.S.	Hispanic	1	May 2017
3	Alexander, Shirley	Jackson State University	B.S.	Black or African- American	3	May 2019
4	Bellamy, Philip	Bethune Cookman College	M.S.	Black or African- American	1	December 2017
5	Boisen, Olivia	California State University, Monterey Bay	B.S.	Asian	1	May 2019
6	Chui, Emily	California State University, Monterey Bay	B.S.	Asian	1	December 2019
7	Etienne- Stanley, Ra'Teema	Florida A&M University	M.S.	Black or African- American	2	August, 2019
8	Flores, Daniel	University of Texas Rio Grande Valley	B.S.	Hispanic	3	December 2019
9	Grant, Jada	Jackson State University	B.S.	Black or African- American	1	May 2019
10	Guruvadoo, Shan	Bethune Cookman College	M.S.	Asian	1	May 2019
11	Leal, Sandra	University of Texas Rio Grande Valley	B.S.	Hispanic	3	May 2019
12	Lecusay, David	University of Texas Rio Grande Valley	B.S.	Hispanic	1	December 2018
13	Lima, Anthony	University of Texas Rio Grande Valley	M.S.	Hispanic	1	December 2018
14	Lopez, Jaime	University of Texas Rio Grande Valley	B.S.	Hispanic	1	May 2018

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Graduates of NOAA CCME

	Name (Last, First)	Partner Institution	Degree	URM Community	Cohort	Graduation Date
15	Madrid, Cristina	University of Texas Rio Grande Valley	M.A.	Hispanic	1	December 2018
16	Martinez, Meghan	Texas A&M University – Corpus Christi	M.S.	Hispanic	1	December 2019
17	Martinez, Summer	Florida Agricultural and Mechanical University	B.S.	Hispanic	3	December 2019
18	Minor, Keenasha	Jackson State University	M.S.	Black or African- American	1	August 2019
19	Perriman, Geramy	Jackson State University	B.S.	Black or African- American	1	May 2019
20	Rodriguez, Cassandra	University of Texas Rio Grande Valley	B.S.	Hispanic	1	December 2018
21	Shokere, Alexis	Florida Agricultural and Mechanical University	B.S.	Black or African- American	1	May 2019
22	Smith, Liyah	Jackson State University	B.S.	Black or African- American	1	April 2018
23	Watson, Harrison	Jackson State University	B.S.	Black or African- American	1	May 2019
24	Webb, Jessica	Jackson State University	B.S.	Black or African- American	1	May 2019
25	Windham, Shelby	Jackson State University	B.S.	Black or African- American	1	May 2019
Graduated Students not from URM Communities						
26	Bauer, Shelby	University of Texas Rio Grande Valley	B.S.		1	May 2019
27	Breaux, Jonathan	Jackson State University	B.S.		1	May 2019
28	Meredith, Melissa	California State University, Monterey Bay	B.S.		1	May 2019
29	Murphy, Elizabeth	University of Texas Rio Grande Valley	M.S.		1	December 2019

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

The Center conducts scientific research as an educational tool for training our students with topics aligned with the special award conditions of the grant. NOAA CCME Research focuses on the areas of Coastal Resilience, Coastal Intelligence and Place-Based Conservation, with research and training conducted in part through NERTOs.

- Four students participated in NERTOs during this reporting period.
- During this reporting period, NOAA CCME had five student-authored papers published in or submitted to peer-reviewed journals and four theses published.
- During this reporting period, NOAA CCME had 32 student presentations and 31 faculty presentations at conferences, meetings, seminars, and workshops.

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NOAA CCME Objective 3. CSC Administration

- NOAA CCME Science Advisory Council and Community Stakeholder Advisory Board members have enhanced participation in NOAA CCME activities through attendance on NOAA CCME monthly calls and interaction with the faculty and students on individual research activities. Additionally, the Council and Board each held teleconferences with NOAA CCME on February 5, 2020. The Stakeholder Advisory Board recommended that NOAA CCME identify and develop collaborations with NERRs. In response, NOAA CCME has identified research opportunities within NERRs at Apalachicola Bay, FL, Mission Aransas, TX, and Eklhorn Slough, CA. FAMU Ph.D. scholar Ashley Lacey has recently been working to develop her dissertation topic with scientists from the Apalachicola National Estuarine Research Reserve, and NOAA CCME is partnering with that NERR in the development of a proposal to the NOAA NOS Planet Stewards involving undergraduate research experience with living shorelines.
- The NOAA CCME Annual Meeting, held in the spring of 2019 at the Southwest Fisheries Science Center in La Jolla, CA, resulted in the beginnings of several collaborative opportunities. During this last reporting period, NOAA CCME has been following up with some of these potential collaborations. Opportunities that have grown from these include:
 - PMEL scientists Drs. Carol Ladd and Phyllis Stabeno, along with Dr. Catherine Berchok, AFSC, are mentoring NOAA CCME scholar Daryin Medley (M.S., FAMU). The result is the development of a thesis topic involving Bering Sea climate and fin whale migrations as well as a NERTO.
 - NOAA CCME Master's student Liyah Smith (FAMU) has also been in discussion with PMEL scientist Dr. Carol Stepien to develop a collaborative research topic.
 - The presentation by Lt. Andy Renaga, NOAA Corps, was provided to NOAA CCME scholars to inform them of career opportunities with OMAO. NOAA CCME scholar Prian Vidal (FAMU) has subsequently applied to NOAA Corps and, following his interview, has been selected as a preferred candidate.
 - NOAA CCME scholar Abraham DaSilvio (BCU), following his discussions with Dr. Chris Kelble (AOML) at the Annual Meeting, developed plans for an upcoming NERTO.
- NOAA CCME has been coordinating with NOAA EPP in preparation of the 10th Biennial NOAA EPP/MSI Education and Science Forum to be held at FAMU at some yet-to-be-determined date (delayed from the planned dates of March 29-April 1, 2020 due to COVID-19).
- NOAA CCME submitted its Briefing Booklet and CCME 101 presentation in preparation for the Fourth-Year Review.

Looking to the Remainder of Year 4

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

- NOAA CCME will recruit students needed to complete its proposed recruitment goals (Appendix A Table 2) and to replace students who have left the Center without graduating. Specific recruitment goals are detailed in Section VI.
- Planned recruitment efforts will include scientific conferences, recruitment of undergraduates in 3+2 BS/MS programs to continue in the pipeline as Master's students, as well as individual recruitment efforts at locally affiliated community colleges.

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

- NOAA CCME expects to identify NOAA mentors for several students and develop NERTO plans. At this time, few additional NERTOs are expected to take place prior to the end of Year 4 due to the COVID-19 pandemic (Section VI), but work will be done to develop SSIOs.
- Twelve NOAA CCME Scholars are expected to graduate prior to the end of Year 4.

NOAA CCME Objective 2. Research

- NOAA CCME had developed the technical program the 10th Biennial NOAA EPP/MSI Forum, which was to take place at the end of March 2020 at Florida A&M University with NOAA CCME scholars and faculty attending and presenting their research. This forum has been delayed due to the COVID-19 pandemic and it is unclear whether this will take place prior to the end of Year 4 (Section VI).
- Several NOAA CCME scholars near completion of their research are working on manuscripts with their academic advisors and NOAA mentors. Several journal manuscripts are expected to be submitted, along with their associated datasets, during the remainder of Year 4.

NOAA CCME Objective 3. CSC Administration

- NOAA CCME will have its Fourth-Year Review. The date has not been determined due to the COVID-19 pandemic (Section VI).
- NOAA CCME will hold an annual meeting prior to the end of Year 4 at a time and location TBD (Section VI).
- Replace Science Advisory Council and Community Stakeholder Advisory Board membership and leadership as needed.

Key Personnel

- NOAA CCME Key Personnel hires are now complete.

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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

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

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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-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-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
Michelle Dovil, Ph.D., Florida A&M University
Dr. David Yoskowitz, Ph.D., Texas A&M University-Corpus Christi
Dr. Owen Temby, Ph.D., University of Texas Rio Grande Valley

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
Mikell Smith, M.S., Texas A&M University-Corpus Christi

Focal Area Participants – Students (See Appendix A Table 1)

II. Accomplishments

Major Activities

During this reporting period, NOAA CCME:

- **Prepared for the upcoming Tenth Biennial NOAA EPP/MSI Education and Science Forum -**
NOAA CCME solicited abstracts for technical talks and poster presentations. Abstract review was conducted in collaboration with NOAA scientists and faculty from the four NOAA CSCs (fifty individuals participated in the review process, including 23 affiliated with NOAA). The final technical program was assembled based on reviews, with 141 poster presentations and 72 contributed talks. Eighteen additional invited speakers were assigned to the technical program through invitation from the CSCs and NOAA EPP. The Forum agenda, including plenary speakers, panels, student-focused sessions, and social activities, was completed. Registration and final preparations for the Forum continued to the end of this reporting period. Unfortunately, following this reporting period, the decision was made following discussion between NOAA EPP and CCME management to postpone the Forum from its planned start date of March 29, 2020 to a later date due to the COVID-19 pandemic (see Section VI).
- **Continued its mission of educating and training the next generation of scientists, particularly from underrepresented minority communities, in NOAA-relevant STEM disciplines and social sciences –**
NOAA CCME trained 73 students and 2 postdoctoral scholars during this reporting period (see Appendix A Table 1).
- **Provided training opportunities to NOAA CCME students to utilize interdisciplinary approaches to address environmental challenges confronting marine and coastal ecosystems –**
Experiential research training activities and accomplishments are detailed below in the summary of NOAA CCME Areas of Focus.
- **Shared research and Center information with the broader community through outreach activities –**
These activities are highlighted below in the summary of NOAA CCME Areas of Focus.

Significant Results:

During this reporting period, NOAA CCME:

- **Had student research published (or submitted to publication) in five peer-reviewed articles and four theses –**
These publications, as well as associated publicly available datasets, are detailed in Section II.

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- **Had 32 student-led presentations and 31 faculty presentations at workshops, meetings, seminars, and conferences of national significance –**
These presentations are detailed in Section II.
- **Secured \$634,000 in leveraged funding for enhanced research opportunities for scholars at the partner institutions –**
This funding is detailed in Section VIII. Financial Information.
- **Had four scholars participate in NERTOs, with five more scholars developing SSIOs with their NOAA mentors –**
These NERTOs are described below in the summary of NOAA CCME Areas of Focus.
- **Had two postdocs participate in NOAA internships –**
CCME Postdoc Dr. Erin Easton completed her internship with Dr. Peter Etnoyer (NOAA/NCCOS Charleston, SC). CCME Postdoc Dr. Emily Jones continues her one-year internship with Jennifer Doerr (NOAA NMFS/SEFSC Galveston, TX).

Key outcomes or other achievements:

During this reporting period, NOAA CCME:

- **Had 73 active students –**
NOAA CCME Students and their statuses are detailed in Appendix A (Table 1).
- **Graduated six students (3 BS, 3 MS), with one additional MS student successfully defending (graduation anticipated May 2020) –**
NOAA CCME graduates are listed in Section II.
- **Recruited 18 additional scholars –**
NOAA CCME added 7 scholars pursuing Bachelor’s degrees, 8 Master’s students, and 3 Ph.D. scholars. These include three scholars that continued within the CCME educational pipeline (one transferring to a partner institution and two continuing at the same institution).
- **Had eleven current or graduated student scholars employed in the NOAA-mission workforce –**
Graduates of NOAA CCME are making an impact in NOAA-relevant STEM and social science fields (Table 6). As a highlight, former CCME scholar Cristina Madrid began employment in the Texas Office of the Governor as a Research Specialist. Her work is closely aligned with her Master’s thesis work conducted at UTRGV, and involves planning, coordinating, and conducting economic policy studies and analyses; determining and evaluating economic factors relating to various programs and projects; and disseminating the collection of information to provide assistance to the Office of the Governor, businesses, and communities in the state. She recently co-authored an article with colleagues in Progress in Disaster Science entitled “[Empirical evaluation of disaster preparedness in the Rio Grande](#)”

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[Valley.](#)” Another NOAA CCME scholar, Mallory Brooks, began working for the NOAA NMRS Southeast Regional Office doing work related to her NERTO. She recently transitioned from that position to an Environmental consulting firm and is in the process of finalizing her thesis. CCME scholar Samuel Mwenda also started a new position with the State of Florida in Environmental Management. Mr. Mwenda is also finalizing edits of his previously defended thesis manuscript to complete graduation requirements. December graduate Taylor Eddy and Miya Pavlock-McAuliffe, who successfully defended in February 2020 and will graduate in May, have begun working for the US Geological Survey. Fall 2019 graduate Elizabeth Murphy began employment at the West Virginia Dept. of Environmental Protection as an Environmental Resource Specialist, and Fall 2019 graduate Brianna Alanis is working at UTRGV as a Research Associate. Finally, current NOAA CCME Scholar Prian Vidal interviewed for NOAA Corps officer training and has been selected as a preferred candidate.

- **Had postdoctoral scholar Dr. Erin Easton complete her postdoctoral position with NOAA CCME in December 2019 –**
Dr. Erin Easton began working at UTRGV as a Research Assistant Professor.
- **Expanded collaboration with other CSCs and MSIs –**
 - NOAA CCME Distinguished Research Scientist Dr. Steve Morey collaborated with the Distinguished Research Scientists from the other three CSCs to develop the scientific program for the NOAA EPP/MSI Education and Science Forum, including coordinate abstract reviews by faculty and NOAA scientists and identifying potential invited speakers.
 - NOAA CCME invited Dr. Scott Knoche, Director of the Morgan State University Patuxent Environmental and Aquatic Research Laboratory, as a guest speaker and to discuss opportunities for collaboration, particularly involving social science research, during a call of the NOAA CCME Focal Areas. NOAA CCME faculty and scholars also attended Dr. Knoche’s OneNOAA Science Seminar virtually following the introductory meeting.

NOAA CCME Areas of Focus

NOAA CCME focuses on three areas of research and training including: Coastal Resilience (CR), Coastal Intelligence (CI), and Place-Based Conservation (PBC), along with two cross-cutting areas of Education and Social Science. Big data training is integrated into all focal areas. 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.

NOAA CCME facilitates student development of competencies aligned with the focal areas (shown in Appendix Table 3) as follows:

- For graduate students:
 - Through courses required for their degree programs;

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- Through their research;
- Through NOAA 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 NOAA CCME webinars;
 - Through mentoring opportunities with NOAA personnel.

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

- Developing synopses of their research plans
- Conducting research leading toward theses, dissertations, and publications
- Participation in and presentation at seminars, workshops, meetings, and conferences
- Participation in the NOAA CCME Center-Wide Core Competency Course (last held in spring 2019, and being planned for spring 2021 in Monterey, CA).
- 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 reports

Focal Area Accomplishments this reporting period:

1. Status of Students (Appendix A Table 1):

Coastal Resilience

- The CR focal area has a total of 8 active students: 2 Ph.D. and 6 M.S. Two students were added to the CR focal area during this reporting period. One of the CR M.S. students successfully defended her thesis and will graduate in May, 2020.

Coastal Intelligence

- The CI focal area has a total of 33 students: 5 Ph.D., 12 M.S., and 16 B.S. scholars. Two M.S. and Ph.D. students were added to the CI focal area during this reporting period. Two M.S. and two B.S. CI scholars graduated during this reporting period.

Place-Based Conservation

- The PBC focal area has a total of 23 active students (4 Ph.D., 14 M.S., and 18 undergraduates), and has previously graduated 10 (1 M.S. and 10 undergraduates). All ten graduating undergraduate students are reported to be continuing in a graduate program, with three remaining with CCME. Two PBC M.S. students graduated during this reporting period.

2. Student synopses (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.)

- Five CCME graduate students presented synopses (which were approved) during this reporting period (For a list of all approved synopses, see Appendix A Table 1):

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- **Sandra Leal** (PBC): Population structure of Red Drum (*Sciaenops ocellatus*) in two systems in the northwestern Gulf of Mexico
- **Juliet Vallejo** (CR): Scientific Knowledge Management in the Gulf of Mexico
- **Ariana Uwaibi** (CI): Toxicity and Physical Responses to Cyanobacterial Harmful Algal Blooms
- **Liyah Smith** (CI): Characterization of the Prokaryotic Epibionts of *Gammarus tigrinus*
- **Daryin Medley** (CI): Fin whale trends in the Bering Sea and Unimak Pass

3. Student NERTO updates (Appendix A Table 1)

- Four NOAA CCME scholars participated in their NERTOs during this reporting period:
 - **Patricia Cockett** (CI), “Temporal and Spatial Comparison of Intertidal Community Dynamics Within Papahānaumokuākea Marine National Monument, Dr. Randall Kosaki, Papahānaumokuākea Marine National Monument
 - **Angelique Rosa-Marin** (CI), “Exploring the use of foraminifera as a bioassay organism for coral reef environments”, Dr. Cheryl Woodley, NOAA NOS NCCOS
 - **Prian Vidal** (CI), “Re-immersion time for reduction of *Vibrio parahaemolyticus* and *Vibrio vulnificus* to ambient concentrations in Eastern Oysters”, Dr. Suzanne Bricker, NOAA NOS NCCOS Oxford
 - **Queriah Simpson** (CI), “Habitat Suitability Models for Deep Sea Corals on the West Florida Escarpment”, Dr. John Christensen, NOAA NOS NCCOS
- SSIOs for five additional NOAA CCME scholars’ NERTOs were developed during this reporting period:
 - **David Lecusay** (PBC), “A multi-metric index for south Florida coastal ecosystems”, Dr. Chris Kelble, NOAA OAR AOML. Planned for spring 2020.
 - **Abraham DaSilvio** (PBC), “Investigating the connection between water quality and coral health”, Dr. Chris Kelble, NOAA OAR AOML. Planned for spring/summer 2020
 - **Elizabeth Harris** (CI), “Ecotoxicology Assessment of Climate and Pesticide Interactions in Estuarine Systems”, Dr. Marie DeLorenzo, NOAA NOS NCCOS. Planned for summer 2020.
 - **Lily Walker** (CI), “Eutrophication, shellfish aquaculture, and bioextraction: ecosystem”, Dr. Suzanne Bricker, NOAA NOS NCCOS. Planned for summer 2020.
 - **Daryin Medley** (CI), “Analysis of Fin Whale Occurrences in the Southeastern Bering Sea”, Dr. Carol Ladd, NOAA OAR PMEL and Dr. Catherine Berchok, NOAA NMFS AFSC. Planned for spring 2020.

4. Student completion of program

- **Briana Alanis** (CI), MS, Marine Biology and Biological Oceanography, UTRGV – Briana Alanis is now working as a Research Associate I at UTRGV.
- **Emily Chui** (CI), BS, Environmental Science, CSUMB
- **Flores, Daniel** (PBC), BS, Biology, UTRGV
- **Meghan Martinez** (CI), MS, Marine Biology and Biological Oceanography, TAMUCC
- **Summer Martinez** (CR), BS, Biology, FAMU – Summer Martinez is continuing as a CCME M.S. student at FAMU.
- **A. Elizabeth Murphy** (PBC), MS, Marine Biology and Biological Oceanography, UTRGV – Elizabeth Murphy is now working as an Environmental Resource Specialist at the West Virginia Dept. of Environmental Protection.
- **Miya Pavlock-McAuliffe** (CR) defended her thesis in February, 2020 and will receive her diploma (M.S. CSUMB) in May. Miya Pavlock-McAuliffe is now working for the US Geological Survey.

5. Leveraged Student Research/Training/Outreach Activities

Coastal Resilience

- **Mariana Leon Perez**, TAMUCC, was in Puerto Rico during September, 2020, collecting field data for her dissertation.
- **Mariana León Pérez**, TAMUCC, attended TA Orientation for Spring 2020/College of Science and Engineering/various speakers/TAMUCC/Basic orientation of the responsibilities of being a TA in January 2020.
- **Mariana León Pérez**, TAMUCC, attended the HRI Science Seminar Series to hear a presentation by Dr. Jessica Dutton and learned about mercury accumulation in fish from the Gulf of Mexico.
- **Mariana León Pérez**, TAMUCC, participated in SMTE 5004 TA Training at TAMUCC and learned teaching techniques.
- **Mariana Leon Perez**, TAMUCC, participated in the COMPASS Science Communication Workshop at Harte Research Institute in September, 2019. Also participating were **Diana Del Angel, and Elizabeth Del Rosario**, TAMUCC, of the PBC focal area.
- **Mariana León Pérez**, TAMUCC, attended the HRI Data Management Workshop with GRIIDC/GRIIDC/Rosalie Rossi and Lalitha Asirvadam on January 16, 2020. She learned the importance of data sharing and guidelines on how to share data through the GRIIDC platform.
- **Anthony Lima**, TAMUCC, attended the Texas Oyster Mariculture meeting on South Padre Island/ UTRGV Coastal Studies Lab with about 35 other attendees. This was a bit of a public information/discussion event. (January 25, 2020)
- **Anthony Lima**, TAMUCC, participated in the Oyster South Industry Symposium in NC and met with state and industry representatives. (February 21 – 23, 2020)
- **Anthony Lima**, TAMUCC, participated in the Oyster Mariculture Task Force Meeting TX Parks & Wildlife Dept. and Texans engaged in the industry. (February 27, 2020)

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Anthony Lima, TAMUCC, participated in Public Scoping Meeting with TX Parks & Wildlife Dept, met with industry and natural resource managers. (March 5, 2020)

Coastal Intelligence

- **Daryin Medley** FAMU, visited PMEL with Dr. Steve Morey in November 2019 to develop an SSIO for a future NERTO with Dr. Carol Ladd and her colleagues. Daryin also received training in acoustic processing software.
- **Queria Simpson**, FAMU, participated on a research cruise aboard the R/V Point Sur in the Gulf of Mexico as part of a NOAA OER-funded project in October, 2019. Also on board were CCME faculty Drs. Steven Morey and Michael Martinez-Colon, as well as Ms. Simpson's NERTO co-mentors Matt Poti and Arliss Winship (NOAA NCCOS).
- **Ariana Uwaibi**, FAMU, visited GLERL in October, 2019 to develop a synopsis and potential future NERTO with Dr. Reagan Errera.
- **Prian Vidal**, FAMU, participated on the NOAA R/V Nancy Foster Mapping of Harmful Algal Blooms cruise on October 2-11, 2019.
- **Lily Walker**, TAMUCC, participated in the professional mentorship program at the CERF conference in November 2019.
- **Molly McBride**, TAMUCC, participated in a Business Etiquette Workshop provided by TAMUCC Career Services and gained training in various aspects of professional conduct and interactions with colleagues. (21 Feb 2020).
- **Jordana Cutajar and Molly McBride**, TAMUCC, participated in Diurnal, a TAMUCC Marine Biology program 24 hour event where a group of graduate students guide undergraduate Marine Biology majors through different types of sampling and lab procedures. Their group taught phytoplankton sampling and water chemistry. The purpose was to give undergrads a diverse experience of sampling and consider whether they want to pursue further education was something they wanted to pursue. (02/14/2020)
- **Jordana Cutajar**, TAMUCC, participated in a Boat Training and gained knowledge of trailering and operating a boat for a sampling event. (02/24/2020)

Place-Based Conservation

- **Abraham DaSilvio**, BCU, visited AOML with Dr. J. Cho in October 2019 to develop an SSIO for a future NERTO with Dr. Chris Kelble. Dr. Cho presented a seminar while at the lab.
- **Victoria Salinas, Daniel Flores, Sandra Leal, and David Lecusay**, UTRGV, participated in Discovery Island on September 21, 2019 at the Gladys Porter Zoo. The UTRGV Team hosted Mesophotic fish count activity featuring 3D underwater video of relic coral reef banks in the southern Gulf of Mexico. 151 participants visited the UTRGV booth. CI student **Brianna Alanis** (UTRGV) also participated in this outreach activity.
- **Ryan Rubino**, TAMUCC, participated in several aquaculture training activities, including attending the Milford Aquaculture Seminar and taking an online course in shellfish farming. He also attended the American Fisheries Society Texas Chapter Conference.

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- **Ryan Rubino**, TAMUCC, participated in Diurnal, a TAMUCC Marine Biology program 24 hour water, benthos, nekton sampling event that takes place in Oso Bay each year. It gives the undergraduates a chance to learn and practice a variety of field techniques used in fisheries and water quality while gathering some useful information. This has been going on for over forty years. Ryan helped run the benthic sampling group and also assisted with the seining and epibenthic sled groups. (February 14, 2020)
- **Ryan Rubino**, TAMUCC, helped set up the aquaponics system that the environmental club at TAMUCC is starting up. This system will be used to grow vegetables in the campus community garden. Ryan will help take care of the system and do water quality in the future when it is up and running. (February 20, 2020)
- **Kelsey Martin**, TAMUCC, participated in a Hydroacoustic Data Analysis Workshop at TAMU-Galveston to receive training on using acoustic data for the Great Red Snapper Count and for her dissertation.
- **Devin Comba**, TAMUCC, gave a presentation at an Oso Bay Wetland Preserve Wetlands Workshop on September 21, 2019 about how oysters shape conditions in local estuaries, what conditions oysters require for survival, and the important role that restoration plays in local oyster reef communities. Hands-on labs included an exercise in salinity (using taste and refractometers), oyster reef community live tank observation, real oyster dissection, and an oyster anatomy activity. Participants included children ages 6-13 and their parents.
- **Devin Comba**, TAMUCC, took DAN Diving First Aid Certification Training on January 9, 2020.
- **Devin Comba and Alyssa Outhwaite**, TAMUCC, participated in the Austin Oyster Festival in Austin, TX on February 29, 2000, as part of the Sink your Shucks oyster shell recycling program with a target audience of the Austin public. They were collecting shell for the oyster recycling program and informing the community about what they do at TAMUCC and how our collections were impacting oyster reefs etc.
- **Alyssa Outhwaite**, TAMUCC, participated in a Business Etiquette Workshop provided by TAMUCC Career Services and learned more about professional communication and working with teams. (21 Feb 2020)
- **Diana Del Angel** TAMUCC, participated in the FEMA HAZUS quarterly webinar in September.
- **Diana Del Angel**, TAMUCC, participated in “New Opportunities for Reducing Coastal Risk with Natural Defenses”; EBM tools and OCTO sponsored webinar (September 17)
- **Diana Del Angel**, TAMUCC, participated in “The Value of Wetlands for Natural Disaster Mitigation”; ASWM webinar (September 25)
- **Diana Del Angel**, TAMUCC, participated in the Business Etiquette Workshop at Harte Research Institute (September 18).
- **Meghan Martinez**, TAMUCC, Volunteered at the West Oso Middle School STEM program in November, 2019.
- **Meghan Martinez**, TAMUCC, Attended a workshop on Career Skills and Development at the Harte Research Institute for Gulf of Mexico Studies in November, 2019.

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- **Meghan Martinez**, TAMUCC, Participated in the Data Management Workshop at the Harte Research Institute for Gulf of Mexico Studies in November, 2019.
- **Elizabeth Del Rosario**, TAMUCC, took a course “Water Law 101” in San Antonio Texas on February 19, 2020.
- **Kelsey Martin**, TAMUCC, participated in Diving Deeper, an Oso Bay Wetland Preserve and Learning Center Workshop. Eco-expert talk designed for children. (10/19/2019)
- **Kelsey Martin**, TAMUCC, participated in a Hydroacoustic Data Analysis Workshop at TAMUG led by Marta D’elia and learned how to analyze her labs acoustic data for the Great Red Snapper Count and for her dissertation. (2/24/2020)
- **Kelsey Martin**, TAMUCC, participated in a NOAA Webinar – Andrew Strelcheck who is a Deputy Regional Administrator at the National Marine Fisheries Service talked about the NMFS mission. (10/15/2019)
- **Kelsey Martin**, TAMUCC, participated in a workshop – Submitting Competitive Internship Applications, SACNAS Conference 2019. (10/31/2019)
- **Kelsey Martin**, TAMUCC, participated in a workshop – Preparing Scientists to Make a Difference: Leadership and Professional Development Training at All Stages, SACNAS Conference 2019. (10/31/2019)
- **Kelsey Martin**, TAMUCC, participated in a workshop – Climate Change Track: Development of Organisms in a Changing Climate, SACNAS 2019. (11/1/2019)
- **Kelsey Martin**, TAMUCC, participated in a workshop – NSF Opportunities for Undergraduates, Graduate Students, and Postdocs in the Biological, Geological, Mathematical, and Physical Sciences. (11/1/2019)
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6. NOAA CCME Postdoctoral Activity

- **Dr. Emily Jones (CI)** continued her NOAA Postdoctoral Internship with Jennifer Doerr and Jennifer Leo from NOAA Southeast Fisheries Science Center examining shrimp growth in salt marsh and mangrove habitats in Port Fourchon, LA
- **Dr. Erin Easton (PBC)** completed her NOAA CCME Postdoctoral training and is now employed as a Research Assistant Professor at UTRGV.

III. Products of Award

The following are products of the FY16 CSC award accomplished during this reporting period.

Degrees Awarded:

1. **Alanis, Briana**, MS, Marine Biology and Biological Oceanography, UTRGV
2. **Chui, Emily**, BS, Environmental Science, CSUMB
3. **Flores, Daniel**, BS, Biology, UTRGV

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4. **Martinez, Meghan**, MS, Marine Biology and Biological Oceanography, TAMUCC
5. **Martinez, Summer**, BS, Biology, FAMU
6. **Murphy, A. Elizabeth**, MS, Marine Biology and Biological Oceanography, UTRGV

Student Publications in Journals:

Only publications with NOAA CCME award attribution are included.

*CCME Faculty, **CCME Student, ^NOAA Collaborator

1. 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).
2. Lima, A.**, D. Kim, A.m. Song, G.M. Hickey, and O. Temby* (2019). Trust and influence in the Gulf of Mexico’s fishery public management network. *Sustainability*, 11, doi:10.3390/su11216090.
3. Waddell, E.N. N. Lascelles**, J.L. Conkle* (2020). Microplastic contamination in Corpus Christi Bay blue crabs, *Callinectes sapidus*. *Limnology and Oceanography Letters*. Doi:10.1002/lol2.10142.
4. Walker, L.** (2019). A systems level analysis of coastal ecosystem responses to hurricane impacts. *Estuaries and Coasts*, In Review.
5. Wu, D. and E.A. Del Rosario** (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:

None to report

Editor of Special Issues

None to report

Books:

None to report

Book Chapters

None to report

Thesis/Dissertations:

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1. Martinez, M. (2019). Reef restoration provides resilient habitat for oysters and fauna. Harte Research Institute for Gulf of Mexico Studies, Thesis. Texas A&M Corpus Christi, ProQuest Number 2352714880.
2. Alanis, B. (2019). Enabling High Quality Oxygen Measurements During Robotic Based Studies of Ocean Ecological and Biogeochemical Processes. Thesis. University of Texas Rio Grande Valley.
3. Murphy, A.E. (2019). Identifying the N Source for Black Mangrove (*Avicennia germinans*) and its Potential Energy Transfer in a South TX Mangrove Forest. Thesis. University of Texas Rio Grande Valley.
4. Pavlock-McAuliffe, M. (2020). Drivers of sub-seasonal to interannual shoreline change at Sunset State Beach in Monterey Bay, CA. Thesis. California State University Monterey Bay.

Conference Papers, Posters and Presentations:

Student Presentations

*CCME Faculty, **CCME Student, ^NOAA Collaborator

1. Alanis, B.** 2019. Enabling High Quality Oxygen Measurements During Robotic Based Studies of Ocean Ecological and Biogeochemical Processes. Thesis defense. UTRGV (November 25, 2019).
2. Chui, E.** 2019. Effects of Sea Star Wasting Disease on Mussel Recruitment, Poster presented at 2019 CERF meeting.
3. Cockett, P.** Panelist in “Inclusion in STEM Track — Diversity and Inclusion in STEM: Winning Strategies and Attitudes for Success” The National Diversity in STEAM Conference, Society for the Advancement of Chicanos and Native Americans in Science, October 31 –November 2, 2019, Honolulu, HI
4. Cockett, P.**, P. Montagna*,. 2019. Comparison of ecosystem responses to long-term climate variability among three estuaries. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
5. DaSilvio**, A. and H.J. Cho*. 2019. Assessment of stormwater pollution within a coastal urban canal basin. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
6. Del Angel, D.**, D. Yoskowitz, M. Bilskie, S. Hagen, K. Wowk. 2019. Understanding the increased cost of storm surge flooding under sea level rise. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL
7. Del Angel, D.**, S. Fiore, T. Hartley, B. Bowes, S. Dohner, D. Kim, S. Marriott, J. Song, J. Goodall, L. Schaffner. 2019. Team Science Approach for Coastal and Marine Resilience. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
8. Del Rosario, E.A.**. 2019. Enhancement of the National Water Model Forecast Predictions by Establishing Correlations in Reservoir Release Datasets with Low

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- Flow Conditions. American Geophysical Union (AGU) Fall Meeting 2019, San Francisco, CA
9. Del Rosario, E.A.**. 2019. National Water Center NERTO Experience: Low Flow Reservoir Release Predictions for the National Water Model. Coastal and Estuarine Research Federation (CERF) 2019 25th Biennial Conference, Mobil, AL.
 10. Eddy, T.**. 2020 Scale Matters: Understanding how small-scale interactions may determine the success of Marine Protected Areas. 2020. Ocean Sciences Meeting, San Diego, CA
 11. Etienne, R.** and H. Chi*, 2019, Predicting Florida RIP Currents via Data Imaging Analytics Techniques, Gateways 2019, Sept. 23–25, 2019
 12. Lima, A.**, D. Ki , A. Song, G. Hickey, O. Temby*. 2019. Connective Capacity and Ecosystem-Based Management in Gulf Coast Fisheries. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
 13. Martin, K.*. 2019. Fish Community Comparison over differing habitats on the Texas shelf. Conference – Council of Principal Investigators and Research Administrators Research Forum, Texas A&M University Corpus Christi, Corpus Christi, TX, October 23, 2019.
 14. Martinez, M.**. 2019. Reef restoration provides resilient habitat for oysters and fauna. Harte Research Institute for Gulf of Mexico Studies, thesis defense.
 15. Martinez, M.**, T. Palmer, N. Breaux, and J. Beseres Pollack*. 2019. Overcoming the odds: restoration of a *Crassostrea virginica* oyster reef in St. Charles Bay, TX 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL
 16. Martinez, M.**, T. Palmer, N. Breaux, and J. Beseres Pollack*. 2019. Conservation and social science: rebuilding resilient habitat and community engagement. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL
 17. Murphy, A. E.**, *C.E. Cintra-Buenrostro, *A. Fierro-Cabo. 2019. Assessing nitrogen transfer in a south Texas Black Mangrove (*Avicennia germinans*) forest. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
 18. ~~Murphy, A. Elizabeth**, C.E. Cintra-Buenrostro*, and A. Fierro-Cabo*. 2019. Assessing nitrogen transfer in a south Texas Black Mangrove (*Avicennia germinans*) forest. 25th Biennial Conference of the Coastal and Estuarine Research Federation. Mobile, AL (November 3-7, 2019).~~
 19. Murphy, A.E**. 2019. Identifying the N Source for Black Mangrove (*Avicennia germinans*) and its Potential Energy Transfer in a South TX Mangrove Forest. Thesis defense. UTRGV (November 18, 2019).
 20. Oliver, T.^, C. Couch, C. Rodriguez**, S. A Sandin, and J. Madine.. 2020. Measuring Realized Resilience: Transforming Large Area Imagery into Coral Demographic Models in the Face of Disturbance. 2020 AGU Ocean Sciences Meeting, San Diego, CA.
 21. Pavlock-McAuliffe, M.**. 2019, Video Observations of Shoreline and Sandbar Migration at a Wave Dominated Barred Beach: Northern Monterey Bay, CA. Seminar presented at U.S. Naval Research Lab, Stennis, MS.
 22. Pavlock-McAuliffe, M.**. 2020. Video Observations of shoreline and sandbar migration at a wave dominated beach: Northern Monterey Bay, California. 2020 AGU Ocean Sciences Meeting, San Diego, CA.

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23. Pugh**, A., M. Rowe^, E.J. Anderson^, S.L. Morey*, C. Jagoe*. 2019. Modeling Pathways of PFAS from Sources to Drinking water in the Great Lakes. 2019 AGU Ocean Sciences Meeting, Poster CP14E-1116.
24. Robert McKinzie**, Raphael Isokpehi, and H.J. Cho*. 2020. Analytics of textual data structures on Visualization in Meteorology. 2020 Indian River Lagoon National Estuary Program, February 13-14, 2020.
25. Robert McKinzie**, Raphael Isokpehi, and H.J. Cho*. 2020. Analytics of textual data structures on Visualization in Meteorology. 2020 Emerging Researchers National (ERN) Conference in STEM, February 6-8, 2020.
26. Rodriguez, C.** , T. Oliver ^ and C. Couch. 2020. Scaling Up Coral Demography: Measuring Coral Vital Rates Using Repeated Photomosaics. 2020 AGU Ocean Sciences Meeting, San Diego, CA.
27. Safieh, M.A., G. Watkins**, S. Krejci*, and J. Calderon. 2019. Machine learning applied for environmental preservation. The Indian River Lagoon Research Institute's 5 th Annual Technical conference on Coastal Water Quality. IRLRI TechCon2019. Sept 27 th 2019.
28. Vallejo, J.,** A. M. Song, C. Gabler, *O. Temby, D. Kim. 2019. A Bibliometric Analysis of Scientific Research in the Gulf of Mexico. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
29. Walker, L.** , M. Wetz**, P. Montagna**, X. Hu, K. Hayes. 2019. Timescales of water quality change in 3 Texas estuaries induced by passage of Hurricane Harvey. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
30. Watkins**, G., M.A. Safieh, S. Krejci*, and J. Calderon*. 2019. Machine learning techniques applied to the data analysis focused on Chlorophyll a density forecasting. The Indian River Lagoon Research Institute's 5 th Annual Technical conference on Coastal Water Quality. IRLRI TechCon2019. Sept 27 th 2019.
31. White**, M., R. McKinzie**, A. DaSilvio**, and H.J. Cho*. 2020. Planning, Permitting, and Use of Native Wetland Plants in Coastal Stormwater Management Projects. 2020 Indian River Lagoon National Estuary Program, February 13-14, 2020.
32. Young, R** 2019. Trophic Niche of the California Spiny Lobster (*Panulirus interruptus*) in MPAs versus non-MPAs in Santa Catalina Island. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.

Faculty Presentations:

1. Beseres Pollack, J.*, T. Palmer, J. H. Grabowski, K. De Santiago, D. Marshall, and A. E. Williams. 2019. Roadmap for restoration: using ecological data to inform resource management and restoration practice. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
2. Bhusal, M., A. Ghimire, Juan Calderon*, Hyun J. Cho*. 2020. Natural Language Processing using Deep Learning for the Indian River Lagoon Algal Bloom Report Analysis. 2020 Indian River Lagoon National Estuary Program, February 13-14, 2020.
3. Breier J.*, E.W. Chan , M. A. Saito, M. Jakuba, B. Alanis, R. Chmiel, M. M. Kellogg, M.R. McIlvin, D.M. Moran, V. Naklicki, P. Lopez, Q.W. Montgomery and

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- R. Johnson. 2020. High-resolution upper ocean metal distributions within the Sargasso Sea revealed using the Clio autonomous vehicle. 2020 AGU Ocean Sciences Meeting, San Diego, CA.
4. Cho*, H.J., M.A. Reiter, R. Isokpehi. 2020. Sustainability as a City Branding: The Halifax River Urban Watershed Sustainability Initiative. The World Conference of Mayors/Historic Black Towns and Settlements Alliance, 2020 Orange County/Orlando/Eatonville Collaboration Conference. January 27-February 2, 2020. Maitland, FL.
 5. Cho, H.J.*. 2019. The Halifax River Urban Watershed Sustainability Initiative: A Place-based sustainability initiative on Central Florida's Atlantic Coast. EnergyWaterFoodNexus International Summit, Nov 6-8, 2019. The Florida A&M University
 6. Cho, H.J.*. 2019. Lecture on Coastal Zone Management. National Garden Clubs' Environmental School II; Series XIII. November 12/13/ 2019, New Smyrna Beach, FL.
 7. Cho, H.J.* 2019. Treatment wetland to reduce nutrient loading from urban stormwater-water runoff into the Halifax River. Florida Native Plant Society, Nov 11, 2019, South Daytona, FL.
 8. Easton, E.*, D. Hicks*, A. Shuler^, P. Etnoyer^, and T. Greig^. 2019. Building the field guide of the future: new approaches to identification of deep-sea corals in the Gulf of Mexico. One NOAA Science Seminar. Charleston, SC (October 15, 2019).
 9. Garza, C.*. 2019. Developing support structures inside and outside academia for students in the ocean sciences. 2019 American Geophysical Union Fall Meeting. San Francisco, CA.
 10. Garza, C.* 2019. A Game of Drones: Opportunities for Advancing Discovery and Innovation in Intertidal Research. Talk presented at 2019 SACNAS Conference.
 11. Garza, C.* 2019. Landscape Ecology in the Rocky Intertidal: Opportunities for Advancing Discovery and Innovation in Intertidal Research. Talk presented at UC-Davis, Bodega Marine Lab.
 12. Garza, C.* 2020, Climate-driven collapse of mussel beds (*Mytilus californianus*) in the Southern California Bight and the twilight of a keystone interaction. 2020, Ocean Sciences Meeting, San Diego, CA.
 13. H.J. Cho*. 2019. Living shorelines and treatment wetland for stormwater runoff management: Engaging waterfront property owners. Oct 22, 2019. NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML), Miami, FL.
 14. Jones, E.*, and R. Zerebecki. 2019. Increased grazing on smooth cordgrass, *Spartina alterniflora*, in the presence of black mangroves, *Avicennia germinans*. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
 15. Jones, K. and R.W. Kulawardhana*. 2020. Evaluation of urban heat island effects using remotely sensed land surface temperature and land use land cover data products. 84th Annual meeting of Mississippi Academy of Sciences (MAS), Feb 20-21, 2020, Biloxi, MS
 16. Kulawardhana R.W.*. 2020. Spatial patterns and temporal dynamics of Mississippi and coastal wetland land use/ land cover. 84th Annual meeting of Mississippi Academy of Sciences (MAS), Feb 20-21, 2020, Biloxi, MS

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17. McLaughlin, R *. 2019. International Legal Implications of Deploying Satellite-based Data Collecting (Biologging) Technologies on Marine Animals,” Invited speaker. Jon Van Dyke Institute/ Korea Institute of Ocean Science and Technology Regional Conference, East-West Center, William S. Richardson University of Hawaii School of Law, Honolulu, HI (September 2019)
18. McLaughlin, R.*. 2019. Overview of the United Nations Convention on the Law of the Sea. Invited Guest Lecture., Texas A&M University – Corpus Christi (September 2019)
19. McLaughlin, R.*. 2019 Marine Scientific Research Provisions of UNCLOS. Invited Guest Lecture, University of Hawaii at Manoa, Honolulu HI (September 2019)
20. Montagna , P*., M. Reuscher, J.. 2020. The Deep-Sea Benthic Footprint of the Deepwater Horizon Oil Spill Was Bigger Than We Thought, Which Is Why Sampling Plans Matter 2020 Gulf of Mexico Oil Spill and Ecosystem Science Conference (GOMOSSES)
21. Montagna, P.*, H. Ehrmann, and E. Kurr. 2019. Focused flows to protect natural nurseries. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
22. Morey, S.L.*, Lateral Mixing Induced by Filaments and Eddies on a Mid-Latitude Shelf Subject to Buoyancy Loss, 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL
23. Mullins, E., *A.Fierro-Cabo. Identifying native plants for use in thorn forest restoration. 24th Annual Conference Meeting, Society for Ecological Restoration Texas Chapter. Galveston, TX (November 8-10).
24. Najera, G., *L. Contreras, *A. Fierro-Cabo, *C. Cintra-Buenrostro. 2019. Potential Effect of Sea Level Rise on Soil Carbon Fluxes in a Mangrove-Marsh-Mudflat Sequence of the Lower Laguna Madre, Texas. ASA-CSSA-SSSA International Annual Meeting. San Antonio, TX. (November 10-13).
25. Robinson, L.* , D. Yoskowitz*. 2019. Panelists: Education partnerships in coastal and marine science (panelist). Coastal and Estuarine Research Federation. Mobile, Alabama.
26. Segura, R., E. Mullins, and *A. Fierro-Cabo. 2019. Invasive African grasses in south Texas: are they allelopathic? 24th Annual Conference Meeting, Society for Ecological Restoration Texas Chapter. Galveston, TX (November 8-10).
27. Smith, M.R.* , R. Mclaughlin*, J. Rousseau, L. Robinson, D. Yoskowitz. 2019. Education partnerships in coastal and marine science (panelist). Coastal and Estuarine Research Federation. Mobile, Alabama
28. Temby, O.* , *D. Hicks, **K. Sanchez. 2019. Facilitating the Development of Partnership-Relevant Competencies through a CenterWide Course. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.
29. Vasquez, E, *A. Fierro-Cabo. 2019. High density planting: positive interactions in thorn forest restoration. 24th Annual Conference Meeting, Society for Ecological Restoration Texas Chapter. Galveston, TX (November 8-10).
30. Wetz, M.*. 2019. Advances in coastal harmful algal bloom science. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.

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31. Yoskowitz, D.*, L. M. Hutchison, P. Hindsley, and R. Caffey. 2019. Social and natural sciences: When the stars align...or don't. 2019 Coastal and Estuarine Research Federation Meeting, Mobile, AL.

Technologies or Techniques:

None to report

Patents:

None to report

Inventions:

None to report

Licenses:

None to report

Websites:

Tenth Biennial NOAA EPP/MSI Education and Science Forum website:

<http://ccme.famu.edu/eppforum2020>

NOAA CCME website: <http://ccme.famu.edu>

Other Products:

Publicly available datasets and products

1. Anthony L., D. Kim, A. M. Song, G. G. Hickey, O. Temby. 2020. Fishery Management Survey in the Gulf of Mexico Center for Coastal and Marine Ecosystems. DOI: 10.7266/M9PGN8EN UDI: NO.x849.000:0001

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

1. Cockett, P. Compilation of data from Papahānaumokuākea Marine National Monument Rocky Intertidal Inlet Surveys. Developed during NERTO “Temporal and Spatial Comparison of Intertidal Community Dynamics Within Papahānaumokuākea Marine National Monument”, NOAA/NOS/ONMS, 2020.
2. DelRosario, E. Flow rate, temperature and fish count data compilation and analyses from California and Texas rivers. Developed during NERTO “Low Flow Reservoir Release Predictions for the National Water Model”, NOAA/NWS National Water Center. 2019
3. Navarro, J. Abundance and biomass of fauna from mangrove sites in the bayous of Port Fourchon, LA. Developed during NERTO “The Distribution and Composition of Estuarine Nekton Species Assemblages in a Changing Salt Marsh-Black Mangrove Landscape”, NOAA/NMFS/SEFSC 2020.

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4. Rodriguez, C.: Vital rates data for corals in the Hawaiian Archipelago from photomosaics and photogrammetry. Developed during NERTO “Scaling up coral demography: Measuring vital rates using repeated photomosaics”, NOAA/NMFS Pacific Islands Fisheries Science Center. 2019.
5. Simpson, Q. Habitat Suitability Models for Deep Sea Corals on the West Florida Escarpment. Developed during NERTO “Building Predictive Models for Deep Sea Coral Distribution in the Eastern Gulf of Mexico on the West Florida Escarpment”, NOAA/NOS/NCCOS. 2019.

IV. Participants in Award Performance

See Executive Summary and Appendix Table 1

Table 2: NOAA CCME Award Participants

Table 2

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	NOAA 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 NOAA CCME Coordinator	139
J. Cho, Ph.D.	Co-principal Investigator	80 hrs/mo, one summer month budgeted, the rest is leveraged.

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Table 2

Name	Most Senior Project Role	Project Hours Worked per Month
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, hours beyond hours assigned to this award are funded through leveraged funding sources. Individuals may fulfill more than one role (e.g., Focal Area Co-Lead and Faculty Advisor). Summer hours must be pre-approved by NOAA CCME Institutional PI based on expected participation through student supervising and other award activities. Faculty must provide justification to NOAA CCME Institutional PI for approved summer funding.**

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What other organizations have been involved as partners?

Table 3: Federal and State Organizations as NOAA CCME Collaborative Partners

Type of Partner Organization:	Organization Name:	Partner's Contribution to NOAA CCME
State/Federal	Elkhorn Slough National Estuarine Research Reserve	Host for thesis research
State	Texas A&M University Corpus Christi	Leveraged Training and Research Opportunities for NOAA CCME students, collaborative research, thesis committee members
Federal	NASA	Leveraged Training and Research Opportunities for NOAA CCME student
State	Texas Parks and Wildlife	Leveraged Training and Research Opportunities for NOAA CCME student
Federal	NGA	Provide research funding, internship and job for NOAA CCME student
Federal	EPA	Funding for the current NOAA CCME students research
State	FDEP	Oversighting of funded research by NOAA CCME students
State	FWC	Providing in-kind services and boat hours for NOAA CCME students
State	Texas Parks & Wildlife Department	Leveraged Training, Research Opportunities, and Research Infrastructure for NOAA CCME student
State	Charles Jacoby, St. Johns River Water Management District	Thesis committee members, communication and sharing of data with NOAA CCME students
State/Federal	Duane De Freese, Indian River Lagoon National Estuary Program	Funding agency liaison and director of the NEP program that provides current research funding for NOAA CCME student research
State	Florida Department of Environmental Protection (FDEP)	Providing external partners of current funded projects; providing guides for field sites, design, and data. Providing funds
Federal	National Geospatial-Intelligence Agency	Sponsored and hired NOAA CCME student's research, internship, and job
State	Annie Roddenberry, Florida Fish and Wildlife Conservation Commission (FWC)	Providing in-kind hours and boat times for projects by NOAA CCME students
Federal	United States Geological Service	Leveraged Research Infrastructure for NOAA CCME student
Federal	Monterey Bay National Marine Sanctuary	Leveraged Training, Research Opportunities, and Research Infrastructure for NOAA CCME student
State/Federal	USC Sea Grant	Providing in-kind funds to support research equipment purchase for CCME
Federal	NOAA Pacific Marine Environmental Lab (PMEL)	Leveraged Training, Research Opportunities, and Research Infrastructure for NOAA CCME student
Federal	NOAA Southwest Fisheries Science Center	Leveraged Training and Research Opportunities, and Research Infrastructure for NOAA CCME student

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Have other collaborators or contacts been involved? Yes

Table 4: Non-Federal or State External Collaborative Partners with NOAA CCME

Type of Partner Organization:	Organization Name:	Partner's Contribution to NOAA CCME
Independent Nonprofit	Woods Hole Oceanographic Institute	Leveraged Training and Research Opportunities for NOAA CCME student
Academic	Mak Saito, Woods Hole Oceanographic Institution / Rod Johnson, Bermuda Institute of Ocean Science	Leveraged Training and Research Opportunities for NOAA CCME student
Academic	Texas State University	Leveraged Training and Research Opportunities for NOAA CCME student
Academic	Dana Yoerger, Woods Hole Oceanographic Institution	Leveraged Training and Research Opportunities for NOAA CCME student
Academic	Mak Saito, Woods Hole Oceanographic Institution	Leveraged Training and Research Opportunities for NOAA CCME student
Academic	Darlene Lim, NASA AMES/ Chris German Woods Hole Oceanographic Research Institution	Leveraged Training and Research Opportunities for NOAA CCME student
Municipal	Cities of New Smyrna Beach, Edgewater, Oakhill, and South Daytona	Providing their properties (e.g. waterfront parks) for research, assist with outreach of the projects/workshops by NOAA CCME students
Municipal	Ginger Adair, Volusia County Environmental Management	Providing in-kind fund and cash matches for projects by NOAA CCME students
Municipal	Marine Discovery Center, Environmental Discovery Centers, and Marine Science Center	Providing platforms for student engagement with the communities
Independent Nonprofit	Project H2O and Riverside Conservancy	Providing volunteering hours/students
Academic	University of Southern California, Wrigley Institute for Environmental Science	Host for thesis research
Independent Nonprofit	Monterey Bay Aquarium Research Institute (MBARI)	Leveraged Research Infrastructure for NOAA CCME student
Academic	Hopkins Marine Station of Stanford University	Leveraged Research Infrastructure for NOAA CCME student
Academic	Moss Landing Marine Labs	Leveraged Training, and Research Infrastructure for NOAA CCME student

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Have NOAA collaborators or contacts been involved? Yes

Table 5: NOAA Individuals as NOAA Collaborative Partners

Table 5

NOAA Mentor Name	NOAA Facility	CCME Scholar Name	Description of Collaboration
Andrew Devogelerare	NOS/Monterey Bay NMS	Lauren Parker; Miya Pavlock McAuliffe	NERTO Mentor
Ashok Deshpande	NMFS/NEFSC	Nigel Lascelles; Julian Venable	NERTO Mentor
Bill Arnold	NMFS/SE Regional Office	Mallory Brooks	NERTO Mentor
Carol Ladd	OAR/PMEL	Daryin Medley	NERTO Mentor
Carol Stepien	OAR/PMEL	Liyah Smith	NERTO Mentor
Chad Entremont	NWS	Keenasha Minor	NERTO Mentor
Charlie Wahle	NOS/National MPA Center	Taylor Eddy	NERTO Mentor
Cheryl Woodley	NOS/NCCOS	Angelique Rosa- Marin; Margarette Bayron-Arcelay	NERTO Mentor
Chris Kelble	OAR/AOML	Brianna Alanis; Phillip Bellamy, Abraham DaSilvio, David Lecusay	NERTO Mentor
Eric Weissberger	NMFS/Office of Habitat Conservation	Meghan Martinez	NERTO Mentor
Greg Duseck	NOS/CO-OPS	Shan Guruvadoo	NERTO Mentor
Jennifer Doerr	NMFS/SEFSC	Javier Navarro; Emily Jones	NERTO Mentor; Postdoctoral Mentor
Joe Serafy	NMFS/SEFSC	Elizabeth Murphy	NERTO Mentor
John Christensen	NOAA/NCCOS	Queriah Simpson	NERTO Mentor
John Jacobs	NOS/NCCOS	Prian Vidal	NERTO Mentor
Kim Penn	NOS/Office of Coastal Management	Cristina Madrid	NERTO Mentor
Leslie Craig	NMFS/SE Regional Office	Samuel Mwenda	NERTO Mentor
Marie DeLorenzo	NOS/NCCOS	Elizabeth Harris	NERTO Mentor
Mark Rowe	OAR/GLERL	Andrea Pugh-Kelley	NERTO Mentor
Mary Culver	NOS/Office of Coastal Survey	Diana DelAngel	NERTO Mentor
Matthew Campbell	NMFS/Office of Habitat Conservation	Kelsey Martin	NERTO Mentor
Michael Churma	NWS/Model Development Laboratory	Ra'Teema Etienne; Josh Rigo	NERTO Mentor

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Michelle Johnson	Office of NMS, Flower Garden Banks	Rebekah Hernandez	NERTO Mentor
Peter Etnoyer	NOS/NCCOS	Erin Easton	Postdoctoral Mentor
Randall Kosaki	NOS/Papahānaumokuākea Marine National Monument	Patricia Cockett	NERTO Mentor
Reagan Errera	OAR/GLERL	Ariana Uwaibi	NERTO Mentor
Scott Large	NMFS/NEFSC	Anthony Lima	NERTO Mentor
Steve Lonhart	NOS/ONMS	Alexandra Thomsen	NERTO Mentor
Suzanne Bricker	NOS/NCCOS	Lily Walker	NERTO Mentor
Thomas Oliver	NMFS/PIFSC	Caroline Rodriguez	NERTO Mentor
Trey Flowers	NWS/National Water Center	Elizabeth DelRosario	NERTO Mentor

Table 6. NOAA CCME Scholars hired within the NOAA Mission Enterprise

NOAA CCME Scholar	Employer
Alanis, Brianna	University of Texas Rio Grande Valley
Bellamy, Philip	National Geospatial-Intelligence Agency
Boisen, Olivia	Point Blue Conservation Science
Brooks, Mallory	NOAA NMRS SE Regional Office
Brooks, Mallory	Zev Cohen (environmental consulting)
Del Angel, Diana	Florida Department of Environmental Protection
Eddy, Taylor	USGS
Madrid, Cristina	Texas Economic Development-Governor’s Business and Community Development Division
Murphy, Ashley (Elizabeth)	West Virginia Department of Environmental Protection
Mwenda, Samuel	State of Florida
Pavlock-McAuliffe, Miya	USGS

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 97 students (pursuing 104 individual degrees) and 2 postdocs 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. NOAA CCME has graduated 28 students earning 29 degrees (20 B.S. and 9

M.S./M.A.), including six (3 B.S. and 3 M.S.) during this award period, in the principal disciplines of this award.

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?

NOAA CCME has increased the number of CSC post-secondary students trained with core competencies relevant to the NOAA-mission workforce, including: 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 and statistical analysis, computer modeling, and algorithm development. These core competencies are achieved through recruitment and graduation of students in Center-approved relevant degree programs to provide this training. To increase the training above the typical academic degree requirements, NOAA CCME students also participate in the Center-Wide Core Competency course (with student competencies detailed in Appendix A Table 3), are provided with additional training (detailed in the Section I description of Areas of Focus under item 5), and conduct research aligned with the CCME focal areas that include social science and big data as cross-cutting themes. The impact on candidate development is tracked and measured through the Individual Student Development Plan. Individual Student Development Plans were assessed with NOAA CCME Scholars at the end of the Fall 2019 semester.

NOAA CCME has increased the number of students educated and graduating with degrees in NOAA mission-related disciplines (six degrees were awarded during this reporting period). In addition to the professional development opportunities detailed in Section I (NOAA CCME Areas of Focus item 5), three graduate scholars participated in their NERTOs at NOAA facilities during this reporting period. Student research was published in five peer-reviewed journal articles and disseminated in 32 oral or poster presentations.

NOAA CCME has increased the number of students, particularly from URM communities, attaining degrees and employment in NOAA mission fields. During this reporting period, NOAA CCME graduated five scholars from URM communities, bringing the Center total number of degrees awarded to students from URM communities to 23 (Executive Summary Table 1a). As detailed in Section I, ten current or former CCME students and one former postdoctoral scholar are employed in NOAA mission fields.

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

Throughout the CSC award, NOAA CCME partner institutions increased their institutional capacity as a result of NOAA CCME through adding faculty, infrastructure, and equipment, and enhancing their education and research programs to provide students with additional proficiencies and skills relevant to the Center and to the NOAA mission. This increase in STEM and social science education and research capacity at these MSIs further enables them to produce graduates that have attained proficiencies and skills relevant to the NOAA mission enterprise. NOAA CCME faculty were additionally awarded \$634,000 in leveraged research funding during

this reporting period. This funding builds upon Center student research activities to support field work for students and to provide additional equipment to be used for student research. This funding is detailed in Section VIII item 2.

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 NOAA CCME Data, Information, and Communication Manager supports this function, coordinating with other NOAA CCME team members to 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 NOAA CCME is 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.

NOAA CCME scholars and faculty conduct research of societal importance. Each student synopsis is evaluated to ensure that the societal relevance of the research is clearly identified. This impactful research is communicated to the scientific community through publications and presentations. During this reporting period, CCME scholars published or submitted five journal articles and four theses. There were 32 student presentations and 31 faculty presentations at conferences, workshops, seminars and meetings. All of these publications and presentations acknowledged NOAA CCME. The NOAA CCME website has been developed to feature research developments and disseminate research results within one year of data collection.

NOAA CCME management, faculty, and students have also had the opportunity to emphasize the importance of their research and the NOAA CSC to Federal, State and Local officials through yearly visits to Capitol Hill and participation in events such as Oceans Day at the Florida Capitol (February 25, 2020). A number of outreach activities were conducted by NOAA CCME scholars during this reporting period as highlighted in the Section I description of Areas of Focus item 5.

VI. Changes / Challenges

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

- Differences between proposed and accomplished student recruitment goals (shown in Appendix A Table 2) and how these are being addressed are explained as follows:
 - To date, NOAA CCME has supported a total of 104 degrees, exceeding the recruitment goal (92 total degrees) through year 4.
 - Of the 104 degree-seeking students, 7 have left the Center without graduating due to academic or personal reasons (see Appendix A Table 1 – red font indicates students leaving the program without completing a degree). When supported students fall below the GPA requirement, an action plan is required to address this deficit. Following the FFO guidelines, students are given one semester to bring their GPA back to 3.0 and NOAA CCME partner institutions provide tutorials and any additional help needed. The following students have left the Center without graduating (* indicates students becoming ineligible or leaving NOAA CCME for personal reasons since Summer 2019):
 - Javier Garcia (B.S. student, UTRGV, academic reasons)
 - Kennedy Gullatte (B.S. student, FAMU, academic reasons)
 - Ayanna Kirby (B.S. student, FAMU, academic reasons)
 - *Devon Preyer (B.S. student, CSUMB, personal reasons)
 - *Gabrielle Figueroa (B.S. student, FAMU, personal reasons)
 - *Benjamin Johnson (B.S. student, FAMU, academic reasons)
 - *Walter Holmes (B.S. student, FAMU, academic reasons)
 - FAMU met its recruitment goal for Bachelor's students (16) through Cohort 3. However, 5 FAMU Bachelor's students have left the program due to academic eligibility or personal reasons. FAMU has recruited an additional Bachelor's student in Cohort 4 (not originally proposed) as a replacement, and will work to recruit three additional students transferring from a community college to fill the remaining open slots.
 - FAMU has recruited a total of 9 Master's students, exceeding its proposed goal of 8. FAMU will use funds remaining in its budget for direct student support to support these extra students.
 - FAMU recruited one of its Cohort 1-2 Ph.D. students during Cohort 3 and has one remaining Ph.D. slot to fill. FAMU had recruited three Ph.D. students to fill these slots (all engineering majors), but each of these students decided to accept other funding opportunities. To address this challenge, NOAA CCME will recruit a FAMU Ph.D. student who is already progressing on a NOAA-relevant research project and will support that student as he/she completes the dissertation research. It is anticipated that this position will be filled during the upcoming semi-annual reporting period.
 - BCU exceeded its recruitment goal for Master's students (4) through Cohort 3, recruiting a total of 6. BCU also added three junior/senior undergraduate students that will potentially continue in the master's program in anticipation of recruiting for year 4. This resulted in no change to the BCU budget total.

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- JSU has exceeded its overall goal for recruiting Bachelor's students (accomplished 11 and proposed 10). BCU will recruit three Master's students by the Fall 2020 to meet the total goal.
 - TAMUCC was delayed in recruiting its Cohort 1 and 2 Master's students, but met the goal during Cohort 3. TAMUCC has now recruit its remaining Master's students in Cohort 4 to meet the overall goal of 6.
 - UTRGV has exceeded its recruitment goal for Bachelor's students. UTRGV will fill the remaining two Master's student positions for Cohort 4 (2 of the Cohort 4 Master's students were brought in during Cohort 3) by Fall 2020. UTRGV has replaced the undergraduate student who left due to academic reasons.
 - CSUMB recruited 1 of its Cohort 3 M.S. students as a Cohort 2 student. CSUMB has replaced the undergraduate student who left due to personal reasons.
- Students recruited by NOAA CCME whose expected graduation dates are after the end of Year 5 of the award are anticipated to receive support after Year 5 using unspent funds during a no-cost extension period.
 - Getting all advisory boards members (stakeholder and science) to meet regularly. The members are encouraged to attend NOAA CCME annual meetings and monthly calls. NOAA CCME held calls with the Science Advisory Council and Community Stakeholder Advisory Board to discuss the need to enhance their participation in the Center, and has requested input from both advisory bodies for suggested replacement members.

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

The COVID-19 pandemic is presenting challenges at the time of this report writing. NOAA CCME is regularly communicating with NOAA EPP to develop plans to address these challenges.

- The 10th Biennial NOAA EPP/MSI Education and Science Forum, originally scheduled for 29 March – 1 April 2020, has been postponed. NOAA CCME is working with vendors to cancel or modify contracts. At this time, a limited number of registration refunds have been requested as participants are awaiting word on the rescheduling of the conference. Once rescheduled, NOAA CCME will adjust the program according to confirmations from participants.
- The schedule for the Center Fourth-Year Review has been postponed. NOAA CCME is awaiting guidance from NOAA EPP.
- NOAA CCME has begun planning for the fourth year Annual Meeting. Should the travel restrictions persist to the end of the funding year preventing in-person meeting at a NOAA facility, NOAA CCME will develop plans for a virtual annual meeting. In this event, NOAA CCME will schedule time for internal meeting with Center faculty and EPP and will arrange for engagement with the broader NOAA through telepresence. A series of virtual seminars and discussion sessions with NOAA personnel to foster future collaboration opportunities is being discussed as an alternative to the preferred face-to-face discussion format.
- Student NERTOs planned for spring and summer 2020 are already being affected by travel restrictions. NOAA CCME will work with NOAA EPP and the NOAA mentors on

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a case-by-case basis as modifications (e.g., teleworking or postponement) become necessary. NOAA CCME will continue to develop projects and SSIOs for future NERTOs.

Changes that have a significant impact on expenditures:

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

VII. Special Award Conditions

This section details the progress made during this reporting period for the specified special award conditions below.

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.

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 publicly at <http://ccme.famu.edu>.

4. EPP/MSI CSC Substantial Involvement and Collaborative Engagement

NOAA 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) are invited to 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.

NOAA CCME collaborated with the other CSCs and NOAA EPP/MSI in planning the 10th Biennial NOAA EPP/MSI Forum, particularly the technical program. The Distinguished Scientists from the four CSCs worked together to coordinate abstract reviews (using Center faculty and NOAA colleagues as reviewers) and recommend programming the presentations. The CSCs also reached out to NOAA colleagues to fill invited speaker roles. The technical monitors of the CSCs also provided input for the technical program and abstract review process.

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

The NOAA Technical Monitors for the Center are involved in facilitating collaborations between NOAA CCME and NOAA scientists for NERTO mentorships and for identifying other student and faculty research opportunities.

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

NOAA CCME monitors student recruitment and academic progress to ensure that all requirements for participant eligibility as detailed in the Special Award Conditions and FFO are met. Monitoring methods include: review of application materials, mid-term and end of academic period check-ins as part of the individual student development plan process, review of student transcripts each semester, and review of data entered into the Student Tracker database. All NOAA CCME supported students sign a memorandum of understanding that details requirements for participation in the program. Direct student support for each participant is detailed in Table 6.

Publications

All publications acknowledging support of this award are reported to NOAA CCME monthly and are reviewed by the Center DRS. Publications are listed on the NOAA CCME website with links to each publication. Publications are also sent to the NOAA Institutional Repository. Successful submissions to the NOAA Institutional Repository are also shared with NOAA EPP/MSI.

Post-Doctoral Program -

NOAA CCME Postdoctoral Research Associate Dr. Emily Jones continued working with her NOAA mentor, Jennifer Doerr (SEFSC Galveston).

During this reporting period, NOAA CCME Postdoctoral Research Associate Dr. Erin Easton completed her internship with Dr. Peter Etnoyer (NCCOS Charleston) and her postdoctoral position with NOAA CCME. Dr. Easton is now working as an Assistant Research Professor at UTRGV.

NERTO and Student Internships with NOAA

Twenty-seven NOAA CCME scholars have completed their NERTOs at NOAA facilities with NOAA federal employees as their mentors. NOAA CCME scholars have also participated in experiential training opportunities aboard NOAA vessels (e.g., the Okeanos).

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

For the current reporting period the Center External Evaluator has received \$15,000 in support.

7. Competitive Award Special Award Condition for EPP/MSI CSC Recipient Institutional MOA Association

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The University/NOAA MOA is incorporated by reference into the terms of the competitive award. Performance reports for the project follow the timetable of the funding program and are submitted directly to the funding program.

8. NOAA Environmental Data and Information

During this reporting period, one data set was publicly archived with DOI 10.7266/M9PGN8EN at the GRIIDC repository. 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 NOAA CCME Data Management Plan of the award proposal.

9. 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.

10. 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 – 08/31/2020 and may be extended through 08/31/2021.

11. NERTO

All NERTOs conducted during this reporting period adhered to the NERTO guidelines for location and duration.

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 82 (seeking 89 degrees) and graduate 24 (25 degrees) in NOAA-mission sciences.
2. **Total number of EPP-funded post-secondary students** who are trained 97 (104 degrees) and graduate 28 (29 degrees) 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 7, NGO community 2, academia 1 or as entrepreneurs 0. (Note: one student has been employed in two different sectors. See Table 6.)
4. **Number of EPP-funded graduates who participate in and complete NOAA agency mission-related postdoctoral level programs** 0.

5. **Total new funds leveraged with NOAA EPP award** (including post-secondary student support): Total leveraged funding for reporting period: \$634,000.

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, Impacts of the Award, and Products of Award.

5.1 Education and Training

Please refer to the Evaluation Plan in Appendix C, Impacts of the Award, 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.*

NOAA CCME has increased the number of CSC post-secondary students trained with core competencies relevant to the NOAA-mission workforce, including: 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 and statistical analysis, computer modeling, and algorithm development. These core competencies are achieved through recruitment and graduation of students in Center-approved relevant degree programs to provide this training. To increase the training above the typical academic degree requirements, NOAA CCME students also participate in the Center-Wide Core Competency course (with student competencies detailed in Appendix A Table 3), are provided with additional training (detailed in the Section I description of Areas of Focus under item 5), and conduct research aligned with the CCME focal areas that include social science and big data as cross-cutting themes. The CWCC was last held during the previous reporting period and is next planned for Spring 2021 in Monterey, CA. The impact on candidate development is tracked and measured through the Individual Student Development Plan. Individual Student Development Plans were assessed with NOAA CCME Scholars at the end of the Fall 2019 semester.

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.*

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- *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.*

NOAA CCME graduated 6 students during the reporting period; 3 B.Sc., 3 M.Sc. Five of these graduates were from URM communities.

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

CCME students received additional training and educational opportunities through seminars and workshops during this reporting period. Other regular NOAA CCME training events (such as those at the NOAA EPP Education and Science Forum and the CWCC) occur outside of this reporting period. Examples of seminars and training opportunities include:

- One NOAA Seminar Series
- Professional development workshops (Detailed in Section 1 description of Areas of Focus, item 5)
- NOAA internship opportunities, such as NERTOs (3 during this period) and cruises (one student participated on a NOAA cruise and one on a cruise related to a NOAA-funded project).

Outcome 4. Reduce the attainment gap for URM students 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.*

A total of 20 URM NOAA CCME Scholars have participated in NERTOs. Currently, eight NOAA CCME scholars or graduates working in NOAA mission-relevant fields are from URM communities.

NOAA CCME Alumni pursuing a higher education degree in NOAA CCME pipeline during this reporting period:

1. Brianna Alannis

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2. Anthony Lima
3. Sandra Leal
4. Nigel Lascelles
5. David Lecusay
6. Liyah Smith
7. Summer Martinez

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.*

See Table 3, Table 4, and Appendix Table 1 for partnerships and collaborations including NOAA mentors.

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.*

During this reporting period, NOAA CCME had five student publications published in or submitted to peer-reviewed journals and five student theses. NOAA CCME also had 32 student presentations and 31 faculty presentations at conferences, meetings, seminars and workshops. One dataset was issued a DOI, and five datasets or tools were developed as part of NERTOs for use at the NOAA host offices.

See Section II. Products of Award and Section V. Impacts of Award for details.

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.*

During the reporting period a total of \$634,000 in new leveraged funding was awarded.

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.*

Center recruitment activities included NOAA CCME representation at the 2019 CERF conference and the SACCNAS Conference. Center-wide use of institutional recruitment efforts and efforts by individual faculty were also employed to meet recruitment requirements of the award.

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.*

Five datasets or tools were developed by NOAA CCME scholars as part of NERTOs for use at the NOAA host offices.

NOAA CCME maintains a website (ccme.famu.edu), and a Facebook page to communicate accomplishments.

NOAA CCME published a full-page advertisement promoting the 20th Biennial NOAA EPP/MSI Education and Science Forum in Florida Trend magazine

(https://s3.amazonaws.com/pageturnpro2.com/Publications/201912/554/93233/PDF/132210014205236059_FITrendsTallahassee_LeonCtyJan_20.pdf)

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

Outputs

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

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- Consistent use of established evaluation practices, including higher education practices, to measure effectiveness of each component of the award.

NOAA CCME utilizes the following formative and summative evaluation methodologies for education outcomes and student progress:

1. CWCC evaluation through Blackboard pre and post-test,
2. Individual Student Development Plan semester reviews,
3. Taskstream project review process,
4. student research presentations through NOAA CCME webinar and student meetings,
5. student respondent surveys to improve Center processes.

The analytical report provided by the external evaluator uses established metrics to measure the 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.

Angelique Rosa Marin is working with her NERTO mentor, Dr. Cheryl Woodley, to develop software to detect bleaching of forams.

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NOAA CCME UTRGV faculty member Dr. Chip Breier, and collaborators are currently developing and testing AUV and ROV based biochemical and ‘omic’ sampling tools.

NOAA CCME scholar Julliet Vallejo is working with her advisor, Dr. Owen Temby, to develop a Bibliometric Analysis of Scientific Research in the Gulf of Mexico.

Appendix A: Summary Tables

Appendix Table 1: NOAA CCME Scholars

Blue entries represent students who have graduated from the program before this reporting period and are no longer active NOAA CCME students (17). Red entries represent students who left the program without completion prior to this reporting period (7). The other 73 students were active participants in NOAA CCME during this reporting period. Green colors represent new entries this reporting period.

NOAA CCME Scholars											
	NOAA CCME Scholar	Degree Level	Institution	Cohort	URM	Focal Area	Faculty Advisor(s)	Synopsis Title	Expected NERTO Participation Dates	NOAA/NERTO Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)
1	Alanis, Brianna	B; M	UTRGV	1; 2	Y	CI	John Breier	-; Using primary productivity proxies as ecosystem health metrics	-; COMPLETED: Spring 2019	-; Dr. Chris Kelble, AOML	-; Patterns of Pelagic Primary Productivity in South Florida Coastal Waters for CSC Graduate Student
2	Alexander, Shirly	B	JSU	3	Y	PBC	Brent Thoma	-	-	-	-
3	Bauer, Shelby	B	UTRGV	1			Alejandro Fierro Cabo	-	-	-	-
4	Bayron-Arcelay, Margarete	D	FAMU	2	Y	CI	Michael Martinez-Colon	It takes two to tango: protist and bacteria as bioindicators of estuarine health in FL and TX	2020 or 2021	Dr. Cheryl Woodley, Research Microbiologist, NOS	Meta-analysis of West Coast MPA Performance
5	Bellamy, Philip	M	BCU	1	Y	CI	J. Cho	-	COMPLETED: Fall 2017	Dr. Christopher Kelble, AOML, NOAA OAR	Determining Trends in Water Quality Using High Resolution Land Use Data

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6	Boisen, Olivia	B	CSUMB	1	Y	CI	John Goeltz	-	-	-	-
7	Breaux, Jonathan	T	JSU	1		PBC	Brent Thoma	-	-	-	-
8	Brooks, Mallory	M	BCU	1		CR	Dr. Hyun Jung (J.) Cho	Evaluating the effectiveness of restored shorelines in mitigating non-point source pollution and climate impacts in the Mosquito Lagoon, Florida, USA	COMPLETED: Summer 2018	Dr. Bill Arnold, NOAA Fisheries Southeast Regional Office	Implementing Ecosystem-based Management in the U.S. Caribbean
9	Brown, Aaliyah	B	FAMU	3	Y	CI	Richard Long	-	-	-	-
10	Bruce, Terrius	T	FAMU	2	Y	CI	Steve Morey	-	-	-	-
11	Byrne, Jamie	B	CSUMB	4	Y		Corey Garza				
12	Chui, Emily	B	CSUMB	1	Y	CI	Alison Haupt	-	-	-	-
13	Cockett, Patricia	D	TAMUCC	1	Y	CI	Paul Montagna	Linking the Land and Sea: Adaptation of Hawaiian Traditional Ecological Knowledge to South Texas Coastal Marine Ecosystems	Completed, Fall 2019	Dr. Randall Kosaki, Papahānaumokuākea Marine National Monument	Temporal and Spatial Comparison of Intertidal Community Dynamics Within Papahānaumokuākea Marine National Monument
14	Comba, Devin	M	TAMUCC	3		PBC	Jennifer Pollack	Advancing oyster reef restoration projects: comparing functions of different habitats and addressing the use of plastic in small-scale restorations		Seeking	In Development

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15	Coogan, Brian	B	FAMU	3		CI	Steve Morey	-	-	-	-
16	Corbett, Rhamira	B	FAMU	3	Y		Michael Abazinge	-	-	-	-
17	Cutajar, Jordana	M	TAMUCC	4	Y	CI	Mike Wetz	In Development		Seeking	In Development
18	DaSilvio, Abraham	M	BCU	2	Y	PBC	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	Spring 2020	Dr. Chris Kelble; AOML Miami, FL	Investigating the connection between water quality and coral health
19	Del Angel, Diana	D	TAMUCC	1	Y	PBC	David Yoskowitz	Assessment of Salt Marsh Ecosystem Services in the US Gulf of Mexico	COMPLETED: Spring 2019	Dr. Mary Culver; NOAA Office of Coastal Survey	Improving Coastal Resilience through the Use of Natural and Nature Based Features
20	Del Rosario, Elizabeth	D	TAMUCC	1	Y	PBC	Richard McLaughlin	Environmental Flows Management Strategy for the Coastal Zone in Texas	COMPLETED: Summer 2019	Dr. Trey Flowers, P.E. Director, Analysis and Prediction Division NOAA/NWS/NW C/Office of Water Prediction	Evaluating indicators of regulatory complexity to understand the cost of compliance
21	Destefano, Antoinette	M	BCU	3			Raphael Isokephi	In Development		Seeking	In Development
22	Duke, Shalalia	B	BCU	3	Y	PBC	Sarah Krejci	-	-	-	-
23	Eddy, Taylor	M	CSUMB	1	Y	PBC	Corey Garza	Multiscale habitat use and effects of MPAs on California spiny lobster success	COMPLETED: Fall 2018	Dr. Charlie Wahle, Senior Scientist, NOAA National Marine Protected Areas Center	Meta-analysis of West Coast MPA Performance

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24	Etienne (Stanley), RaTeema	M	FAMU	2	Y	CI	Hongmei Chi	Predict Florida Beach rip current via Data Analytics Techniques	COMPLETED: Summer 2019	Mike Churma and Dr. Jung-Sum Im, Meteorological Development LaboratoryOffice of Science and Technology IntegrationNWS	Rip Current Model Validation
25	Figueroa, Gabrielle	T	FAMU	2	Y	CI	Michael Martinez-Colon	-	-	-	-
26	Flores, Daniel	B	UTRGV	2	Y	PBC	Alejandro Fierro Cabo	-	-	-	-
27	Garcia, Javier	B	UTRGV	2	Y		John Breier	Using computer vision techniques for event classification and data compression during autonomous oceanographic missions.	-	-	-
28	Garrett-Mills, Amonra	T	FAMU	4	Y						
29	Gonzalez, Edith	B	UTRGV	4	Y	PBC	Carlos Cintra				
30	Grant, Jada	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
31	Gullatte, Kennedy	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
32	Guruvadoo, Shan	M	BCU	1	Y	CI	Craig Tinus	Investigating causes of changing tidal range and timing in U.S. harbors	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	Investigating Causes of Changing Tidal Range and Timing in U.S. Harbors

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33	Hamilton, Alexis	B	FAMU	1	Y	CI	Richard Long	-	-	-	-
34	Harris, Elizabeth	M	TAMUCC	3		CI	Paul Montagna	Under development	Summer 2020	Dr. Marie DeLorenzo, NCCOS	Ecotoxicology Assessment of Climate and Pesticide Interactions in Estuarine Systems for CCME Student
35	Hernandez, Rebekah	M		1	Y	PBC	David Hicks	Assessing long-term benthic community dynamics at the Flower Garden Banks National Marine Sanctuary	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	East Flower Garden Bank Photostation Coral Species Identification and Historical Coral Cover Analysis for CSC Graduate Student
36	Holmes, Walter	B	FAMU	1	Y		Charles Jagoe	-	-	-	-
37	Johnson, Benjamin	B	FAMU	1	Y		-	-	-	-	-
38	Jones, Kennedy	B	JSU	2	Y	CI	Ranjani Kulawardhana	-	-	-	-
39	Kilbane, Sarah	B	CSUMB	4			Corey Garza				
40	Kirby, Ayanna	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
41	Lacey, Ashley	D	FAMU	3	Y		Phyllis Gray-Ray	In Development		Seeking	In Development

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42	Lascelles, Nigel	M; D	FAMU; TAMUCC	1; 3	Y	CI	Charles Jagoe; Jeremy Conkle	Oysters as sentinels of microplastic pollution; In development	COMPLETED: June 1 - August 31, Summer 2018; Anticipated Summer 2021	Dr. Ashok Deshpande, Sandy Hook, Northeast Fisheries Science Center; Seeking a NOAA mentor	Chemical Characterization of Microplastics Polymers; To be developed
43	Leal, Sandra	B; M	UTRGV	3; 4	Y	PBC	Carlos Cintra; Carlos Cintra	Population structure of Red Drum (<i>Sciaenops ocellatus</i>) in two systems in the Northwestern Gulf of Mexico	-	Seeking	-
44	Lecusay, David	B; M	UTRGV	1; 3	Y	PBC	Carlos Cintra; Alejandro Fierro Cabo	-; Refining and validating a multimetric index for ecosystem health assessment and monitoring of deltaic freshwater wetlands of the Rio Grande	-; Anticipated March 2020	-; Dr. Chris Kelble, NOAA OAR AOML	-; A multi-metric index for south Florida coastal ecosystems
45	León Pérez, Mariana	D	TAMUCC	2	Y	CR	Dr. James Gibeaut	Massive Arrivals of Pelagic Sargassum: Vulnerability of Coastal Social-Ecological Systems to Sargassum Beaching Events	Summer 2021 (tentative)	Pending	To be developed
46	Lima, Anthony	M; D	UTRGV; TAMUCC	1; 3	Y	PBC; CR	Owen Temby; Dr. Richard McLaughlin	Inter-agency Cooperation, Policy, and Management of the Gulf of Mexico Fishery; Exploring Oyster Aquaculture Potential and Investigating Economic, Ecological, and Legal Barriers	COMPLETED: June 4th - August, Summer 2018; Summer 2021 (tentative)	Dr. Scott Large, Northeast Fisheries Science Center, NMFS; Seeking a NOAA mentor	Evaluating Indicators of Regulatory Complexity to Understand the Cost of Compliance; -
47	Lopez, Jaime	B	UTRGV	1	Y		Owen Temby	-	-	-	-

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48	Lyons, Willis	D	FAMU	2	Y		Michael Abazinge	In Development	Anticipated Summer 2021	Pending	To be developed
49	Machado, Malia	B	CSUMB	4	Y	CI	Nathaniel Jue	-	-	-	-
50	Madrid, Cristina	M	UTRGV	1	Y	CR	Dr. Owen Temby	Disaster Coordination in the Rio Grande Valley	COMPLETED: Summer 2018	Kim Penn, Silver Spring, MD at NOAA facility and College Park, MD at the University of Maryland College Park	Gray, Green, and Cultural Infrastructure Solutions to Enhance Coastal Resilience
51	Martin, Kelsey	D	TAMUCC	2		PBC	Greg Stunz	Characterizing large predatory fish across Gulf of Mexico habitat	Spring 2021	Matthew Campbell National Marine Fisheries Service Pascagoula, MS	Developing and Implementing a Simulation Model for Economically Important Species at Varying Densities of Artificial Reefs
52	Martinez, Meghan	M	TAMUCC	1	Y	CI	Jennifer Pollack	Influence of oyster reef restoration on benthic infauna and reef-associated macrofauna	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	Data needs for planning and assessment of Oyster (<i>Crassostrea virginica</i>) restoration in the Northern Gulf of Mexico under the Deepwater Horizon Natural Resource Damage Assessment (NRDA)
53	Martinez, Summer	T;M	FAMU	3;4	Y	CI/CR	Richard Long	To be developed-	-	Seeking	To be developed
54	McBride, Molly	M	TAMUCC	4		CI	Mike Wetz	In Development		Seeking	In Development

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55	McKinnon, Tayler	B	FAMU	1	Y			-	-	-	-
56	McKinzie, Robert	B	BCU	3	Y	CI	Hyun Cho	-	-	-	-
57	Medley, Daryin	M	FAMU	3	Y	CI	Steven Morey	Fin Whale Trends in the Bering Sea and Unimak Pass	April 2020	Dr. Carol Ladd, OAR/PMEL; Dr. Catherine Berchok, NMFS/AFSC	Analysis of Fin Whale Occurrences in the Southeastern Bering Sea
58	Meredith, Melissa	B	CSUMB	1		CI	Cheryl Logan	-	-	-	-
59	Miller, Andria	B	JSU	4	Y		Brent Thoma	-	-	-	-
60	Minor, Keenasha	M	JSU	1	Y	CI	Fengxiang Han	Analysis of Naturally Occurring Radionuclides in the Northern Gulf of Mexico	COMPLETED: Summer 2019	Chad Entremont, NWS	Meso-photic reefs of the Monterey Bay National Marine Sanctuary
61	Molina, Mario	B	UTRGV	4	Y	PBC	David Hicks	-	-	-	-
62	Murphy, Elizabeth	M	UTRGV	1		PBC	Carlos Cintra	Tracking nitrogen transfer through Black Mangrove (Avicennia germinans) communities	COMPLETED: Spring 2019	Dr. Joe Serafy (NOAA/NMFS/SEFSC) in Miami, FL	Patterns of change in the fish assemblages of Biscayne Bay mangroves
63	Mwenda, Samuel	M	BCU	1	Y	CR	Dr. Hyun Jung (J.) Cho	Assessing Treatment Wetland Efficacy and Public Education in Stormwater Treatment Utilizing Native Wetland Plants	COMPLETED: Summer 2019	Leslie Craig and Dr. Lisa Vandiver, NOAA Fisheries Southeast Regional Office	Identification of cost-effective salt marsh restoration opportunities along the South Atlantic coast
64	Navarro, Javier	M	UTRGV	2	Y	PBC	Alejandro Fierro Cabo	Analysis of the facilitative relationship between Batis maritima and Avicennia germinans seedlings as	COMPLETED: Summer 2019	Jennifer Doerr, SEFSC	The distribution and composition of estuarine nekton species assemblages in a changing salt marsh-

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								mangrove restoration strategy			black mangrove landscape for NOAA EPP Graduate Student
65	Outhwaite, Alyssa	D	TAMUCC	4		PBC	Jennifer Pollack	To be developed-	-	Seeking	To be developed
66	Parker, Lauren	M	CSUMB	1		PBC	James Lindholm	The ecology of organisms on the “lost reefs” of the MBNMS: diver-held video surveys from 20-40 m water depth.	COMPLETED: Fall 2018	Dr. Andrew Devogelaere, Research Coordinator, Monterey Bay NMS	Meso-photic reefs of the Monterey Bay National Marine Sanctuary
67	Pavlock McAuliffe, Miya	M	CSUMB	1	Y	CR	Dr. Rikk Kvitek (CSUMB) & Dr. Tom Connolly (Moss Landing Marine Laboratories)	Quantifying Sediment Transport Along a Rocky Embayed Coastline: The Southern Monterey Bay, CA	COMPLETED: Summer 2019	Dr. Andrew Devogelaere, Research Coordinator, Monterey Bay	Geospatial data collection and visualization to enhance resource manager/scientist collaborations- for EPP CSC student
68	Perriman, Geramy	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
69	Preyer, Devon	B	CSUMB	3	Y	CI	Steve Moore	-	-	-	-
70	Pugh-Kelley, Andrea	D	FAMU	2	Y	CI	Steve Morey	Pathways of PFAS in the Great Lakes from Sources to Water Intakes and Human Consumption	COMPLETED: Summer 2019	Dr. Mark Rowe, GLERL	Numerical Simulation of PFAS in the Great Lakes for NOAA EPP Graduate Student
71	Ray, Carlos	B	FAMU	3	Y	CI	Michael Abazinge	-	-	-	-
72	Rigo, Joshua	M	FAMU	3	Y	CI	Hongmei Chi	To be developed	-	Mike Churma, NWS/MDL	To be developed

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NOAA CCME Scholars											
	NOAA CCME Scholar	Degree Level	Institution	Cohort	URM	Focal Area	Faculty Advisor(s)	Synopsis Title	Expected NERTO Participation Dates	NOAA/NERTO Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)
73	Roberts, Jordan	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
74	Rodriguez, Caroline	M	CSUMB	3	Y	PBC	Cheryl Logan	Physiological responses of corals to temperature stress	Completed, Fall 2019	Dr. Thomas Oliver, Pacific Islands Fisheries Science Center	Scaling Up Coral Demography: Measuring Vital Rates Using Repeated Photomosaics
75	Rodriguez, Cassandra	B	UTRGV	1	Y		David Hicks	-	-	-	-
76	Rolle, Shaquila	B	FAMU	1	Y	CI	Richard Long	-	-	-	-
77	Rosa-Marin, Angelique	M	FAMU	1	Y	CI	Michael Martinez-Colon	Implementation of the FORAM Index (FI) in coral reefs from Jobos Bay at Puerto Rico	Completed, Fall 2019	Dr. Cheryl Woodley, NOS	Exploring the use of foraminifera as a bioassay organism for coral reef environments
78	Rubino, Ryan	M	TAMUCC	3	Y	PBC	Joe Fox	To be developed-	Summer 2021	Seeking	To be developed
79	Salinas, Victoria	M	UTRGV	3	Y	PBC	David Hicks	Growth and Reproduction studies of Black Corals (antipatharians): South Texas	Anticipated Summer 2020	Dr. Cheryl Woodley, NOS	To be developed
80	Sanchez, Katia	B	UTRGV	3	Y		Owen Temby	-	-	-	-
81	Shokere, Alexis	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
82	Simpson, Queriah	M	FAMU	3	Y	CI	Michael Abazinge	Characterization of the microbiome of deep-water corals along the West Florida Slope	COMPLETED: Summer 2019	John Christensen, NCCOS, NOS	Linking habitat suitability models for deep-sea corals with exploration to discover unique microbiota on the west Florida slope for CSC graduate student

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83	Smith, Liyah	T; M	JSU; FAMU	1; 3	Y	CI	Brent Thoma; Richard Long	Characterization of the Prokaryotic Epibionts of <i>Gammarus tigrinus</i>	-; Anticipated Summer 2020	-; Pending	-; To be developed
84	Thomsen, Alexandra Shien-li	M	CSUMB	3	Y	PBC	Arlene Haffa	Evaluating indicators of and factors contributing to restoration success in a large-scale experiment	Completed: Fall 2019	Dr. Steve Lonhart, ONMS	Exploring the use of foraminifera as a bioassay organism for coral reef environments for CSC Student
85	Uwaibi, Ariana	D	FAMU	2	Y	CI	Richard Long	In development	Summer 2020	Dr. Reagan Errera, OAR/GLERL	To be developed
86	Vallejo, Juliet	M	UTRGV	4	Y	CR	Owen Temby	Scientific Knowledge Management in the Gulf of Mexico		Seeking	-
87	Vance, Miracle	B	JSU	3	Y			-	-	-	-
88	Vaughn, Natalie	B	CSUMB	3	Y	PBC	John Olson	-	-	-	-
89	Venable, Julian	D	JSU	1	Y	PBC	Ibrahim Farah/Brent Thoma	Densities and potential impacts of microplastics in Grand Bay National Estuarine Research Reserve	COMPLETED: Summer 2019	Ashok Deshpande NEFSC Habitat Ecology Branch NMFS Sandy Hook, NJ	Characterization of microplastics collected from the beaches, for CSC Graduate Student
90	Vidal, Prian	M	FAMU	1	Y	CI	Charles Jagoe and Elijah Johnson	Nitrogen sequestration associated with oyster aquaculture in the Oyster Bay, Aquaculture Use Zone, Wakulla Co, FL	COMPLETED: Fall 2019	Dr. Suzanne Bricker, Physical Scientist and Manager of NOAA's National Estuarine Eutrophication Assessment, NCCOS, Cooperative Oxford	Re-immersion time for reduction of <i>Vibrio parahaemolyticus</i> and <i>Vibrio vulnificus</i> to ambient concentrations in Eastern Oysters

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NOAA CCME Scholars											
	NOAA CCME Scholar	Degree Level	Institution	Cohort	URM	Focal Area	Faculty Advisor(s)	Synopsis Title	Expected NERTO Participation Dates	NOAA/NERTO Mentor's Name or Potential NOAA Mentors or NOAA Office of Interest	NOAA Mission-Aligned Research Project Title (to be determined in collaboration with NOAA mentor)
										Laboratory	
91	Walker, Lily	D	TAMUCC	1	Y	CI	Michael Wetz	Dissolved Oxygen Dynamics in Texas Estuaries	Summer 2020	Dr. Suzanne Bricker, Physical Scientist and Manager of NOAA's National Estuarine Eutrophication Assessment, NCCOS, Cooperative Oxford Laboratory	Eutrophication, shellfish aquaculture, and bioextraction: ecosystem services provided by oysters
92	Watkins, Gabrielle	B	BCU	3	Y	CI	Juan Calderon	-	-	-	-
93	Watson, Harrison	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
94	Webb, Jessica	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
95	White, Miranda	M	BCU	4	Y	PBC	J. Cho	To be developed		Seeking	-
96	Windham, Shelby	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
97	Young, Riley	B	CSUMB	3		PBC	Corey Garza	-	-	-	-

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*Appendix Table 2: Number of Degrees Supported by Cohort (Sept. 2016-Feb. 2020)**

Institution	Degree	Proposed	Accomplished	Proposed	Accomplished	Proposed	Accomplished*
FAMU							
	Cohort 1 and 2			Cohort 3		Cohort 4	(In Progress)
	Bachelor's	11	11	Bachelor's	5	5	Bachelor's 0 1
	Master's	4	4	Master's	0	4	Master's 4 1
	PhD	6	4	PhD	0	1	PhD 0 0
B-CU							
	Cohort 1 and 2			Cohort 3		Cohort 4	
	Bachelor's	0	0	Bachelor's	0	3	Bachelor's 0 0
	Master's	4	5	Master's	0	1	Master's 4 1
	PhD	0	0	PhD	0	0	PhD 0 0
CSUMB							
	Cohort 1 and 2			Cohort 3		Cohort 4	
	Bachelor's	3	3	Bachelor's	0	3	Bachelor's 3 3
	Master's	2	3	Master's	3	2	Master's 0 0
	PhD	0	0	PhD	0	0	PhD 0 0
JSU							
	Cohort 1 and 2			Cohort 3		Cohort 4	
	Bachelor's	5	8	Bachelor's	2	2	Bachelor's 3 1
	Master's	2	1	Master's	0	0	Master's 2 0
	PhD	1	1	PhD	0	0	PhD 0 0
TAMUCC							
	Cohort 1 and 2			Cohort 3		Cohort 4	
	Bachelor's	0	0	Bachelor's	0	0	Bachelor's 0 0
	Master's	3	1	Master's	0	3	Master's 3 2
	PhD	5	6	PhD	0	2	PhD 0 1
UTRGV							
	Cohort 1 and 2			Cohort 3		Cohort 4	
	Bachelor's	5	7	Bachelor's	0	2	Bachelor's 0 2
	Master's	6	6	Master's	0	2	Master's 6 2
	PhD	0	0	PhD	0	0	PhD 0 0
Center Total							
	Cohort 1 and 2			Cohort 3		Cohort 4	
	Bachelor's	24	29	Bachelor's	7	15	Bachelor's 6 7
	Master's	21	20	Master's	3	12	Master's 19 6
	PhD	12	11	PhD	0	3	PhD 0 1
TOTAL		57	60		10	30	25 14
Total Degrees Proposed		92	<i>Total degrees proposed excludes Postdoctoral research associates (2)</i>				
Total Degrees Supported		104	<i>Total degrees supported excludes Postdoctoral research associates (2)</i>				
<i>* Differences between proposed and accomplished goals are explained in Section VI.</i>							

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Appendix Table 3: Student Competencies

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

Appendix B: Advisory Boards

8. Science Advisory Council Members

9. 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.

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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

NOAA 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

The CCME Management engaged in several collaborative efforts with the External Evaluator in alignment with the CCME Comprehensive Evaluation Plan. The Assistant Director and Education Expert held a conference call with External Evaluator to review the guidelines for the 4th Year Review. The External Evaluator worked with the CMT to draft an outline for the NOAA CCME Self-Study Report submitted to NOAA EPP for the purpose of the Fourth Year External Review. The External Evaluator conducted a conference call with the CMT and Center Director to review the CCME Assessment and Evaluation Alignment Matrix and the measures used to frame the project evaluations. The External Evaluator also engaged in multiple monthly Evaluation calls. The External Evaluator and associate spent several hours preparing and submitting the 3rd Year Evaluation Report, including the review of the Data Template for project Year 3. The Stellar Associate also prepared a summary of the NOAA CCME Stakeholder Perception Surveys. The Evaluator has drafted and submitted the Comprehensive Fourth Year Evaluation Plan.

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VIII. Financial Information

1. Total NOAA funding breakout

FY 16 Award Center base funds: Indicate how funds were used for the reporting period, using award budget categories to provide detailed information for reporting period. Unobligated balances will be compared with SF 425 reporting.

2. Total leverage funding breakout

Indicate funding source, type (grant or contract), amount, Center PI, project title; and, how funding contributed to the FY 16 Center award for:

Postsecondary Student Support:

- Puerto Rico Sea Grant, \$119,000. PI Michael Colon- Martinez. Funds are leveraged to pay for field sampling for Angelique Rosa-Marin's thesis work.
- USC Sea Grant, \$5,000, PI Corey Garza. These funds will support the purchase of a multi-spectral camera for NOAA CCME drones at CSUMB.
- Bethune-Cookman University , \$10,000, PI J. Cho, Branding the Halifax River Urban Watershed Sustainability to Raise the Research Reputation at BCU. This project will provide research opportunities for CCME scholars.
- National Science Foundation Coastlines and People Program, \$500,000, PI Corey Garza. CoPe RCN: new Technology to Inform Coastal Science and Management. This project will provide enhanced capacity to train students in coastal sciences.

Total leveraged funding for reporting period: \$634,000