

# NOAA CENTER FOR COASTAL AND MARINE ECOSYSTEMS (CCME)

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Semi-Annual Performance Report for  
Award Number NA16SEC4810009  
Reporting Period: March 1, 2020 – August 31, 2020

## **Lead Institution - Florida A&M University**

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

Dr. Larry Robinson  
Director and Principal Investigator

## **Partner Institutions**

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

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

Jackson State University  
*Dr. Timothy Turner (Institutional PI)*

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

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

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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

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

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 March 1, 2020 - August 31, 2020 for the National Oceanic and Atmospheric Administration's Center for Coastal and Marine Ecosystems (NOAA CCME). During this reporting period, NOAA CCME supported 76 students (89% from URM communities, Appendix A Table 1), with a total of 110 students (pursuing 118 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 13 students (9 B.S. and 4 M.S.), 12 of these being from URM communities. To date, NOAA CCME has graduated 41 students with 42 degrees – 13 Master's and 29 Bachelor's - with 37 (90%) of the students earning degrees being from URM communities (Table 1a).
- Two of the NOAA CCME graduates from this reporting period have been hired in NOAA-relevant STEM and social science fields (Appendix A Table 6). This brings the total number of NOAA CCME current or former scholars who are employed in NOAA mission-relevant fields to 15 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.
- Twelve new scholars were recruited and began their degrees with NOAA CCME, plus Spring 2020 graduate Miranda White (B.S. NOAA CCME B-CU), is now continuing as a M.S. student with NOAA CCME at B-CU.
- One NOAA CCME Graduate Scholar completed his NERTO virtually during this reporting period, bringing the total number of students completing NERTOs to date to 28. Seven additional NOAA CCME scholars have developed and applied for SSIOs with their NOAA NERTO mentors. Two of these upcoming NERTOs will be conducted virtually in the Fall of 2020 with the rest planned for 2021 as COVID-19 restrictions ease (they will be modified for virtual participation if necessary).
- Former NOAA CCME Postdoctoral Researcher Dr. Erin Easton was hired as an Assistant Professor at UTRGV and is now a NOAA-CCME affiliated faculty member.

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- NOAA CCME Fall 2019 graduate Meghan Martinez (M.S. NOAA CCME TAMUCC) was awarded the NOAA Coastal Management Fellowship and will be working at the California State Coastal Conservancy.
- During this reporting period NOAA CCME Postdoctoral Researcher Dr. Emily Jones completed her Postdoctoral NOAA internship at NOAA SEFSC Galveston, TX under the supervision of her NOAA mentor Jennifer Doerr.

*Table 1. Graduates of NOAA CCME*

**Graduates of NOAA CCME**

	Name (Last, First)	Partner Institution	Degree	URM Community	Cohort	Graduation Date
<b>Graduated Students from URM Communities</b>						
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 University	M.S.	Black or African-American	1	December 2017
5	Boisen, Olivia	California State University, Monterey Bay	B.S.	Asian	1	May 2019
6	Bruce, Terrius	Florida A&M University	B.S.	Black or African-American	2	May 2020
7	Chui, Emily	California State University, Monterey Bay	B.S.	Asian	1	December 2019
8	Etienne-Stanley, Ra'Teema	Florida A&M University	M.S.	Black or African-American	2	August, 2019
9	Flores, Daniel	University of Texas Rio Grande Valley	B.S.	Hispanic	3	December 2019
10	Gonzalez, Edith	University of Texas Rio Grande Valley	B.S.	Hispanic	4	July 2020
11	Grant, Jada	Jackson State University	B.S.	Black or African-American	1	May 2019
12	Guruvadoo, Shan	Bethune-Cookman University	M.S.	Asian	1	May 2019
13	Jones, Kennedy	Jackson State University	B.S.	Black or African-American	2	May 2020
14	Leal, Sandra	University of Texas Rio Grande Valley	B.S.	Hispanic	3	May 2019
15	Lecusay, David	University of Texas Rio Grande Valley	B.S.	Hispanic	1	December 2018
16	Lima, Anthony	University of Texas Rio Grande Valley	M.S.	Hispanic	1	December 2018
17	Lopez, Jaime	University of Texas Rio Grande Valley	B.S.	Hispanic	1	May 2018
18	Madrid, Cristina	University of Texas Rio Grande Valley	M.A.	Hispanic	1	December 2018

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**Graduates of NOAA CCME**

	<b>Name (Last, First)</b>	<b>Partner Institution</b>	<b>Degree</b>	<b>URM Community</b>	<b>Cohort</b>	<b>Graduation Date</b>
19	Martinez, Meghan	Texas A&M University – Corpus Christi	M.S.	Hispanic	1	December 2019
20	Martinez, Summer	Florida A&M University	B.S.	Hispanic	3	December 2019
21	Minor, Keenasha	Jackson State University	M.S.	Black or African- American	1	August 2019
22	Navarro, Javier	University of Texas Rio Grande Valley	M.S.	Hispanic	2	July 2020
23	Pavlock- McAuliffe	California State University, Monterey Bay	M.S.	Asian	1	May 2020
24	Perriman, Geramy	Jackson State University	B.S.	Black or African- American	1	May 2019
25	Rodriguez, Cassandra	University of Texas Rio Grande Valley	B.S.	Hispanic	1	December 2018
26	Rolle, Shaquila	Florida A&M University	B.S.	Black or African- American	1	May 2020
27	Shokere, Alexis	Florida A&M University	B.S.	Black or African- American	1	May 2019
28	Simpson, Queriah	Florida A&M University	M.S.	Black or African- American	3	July 2020
29	Smith, Liyah	Jackson State University	B.S.	Black or African- American	1	April 2018
30	Thomsen, Alexandra	California State University, Monterey Bay	M.S.	Asian	3	July 2020
31	Vance, Miracle	Jackson State University	B.S.	Black or African- American	3	May 2020
32	Vaughn, Natalie	California State University, Monterey Bay	B.S.	Native American	3	May 2020
33	Watson, Harrison	Jackson State University	B.S.	Black or African- American	1	May 2019
34	Watson, KiAnna	Bethune-Cookman University	B.S.	Black or African- American		May 2020
35	Webb, Jessica	Jackson State University	B.S.	Black or African- American	1	May 2019
36	White, Miranda	Bethune-Cookman University	B.S.	Black or African- American	4	May 2020
37	Windham, Shelby	Jackson State University	B.S.	Black or African- American	1	May 2019
<b>Graduated Students not from URM Communities</b>						
38	Bauer, Shelby	University of Texas Rio Grande Valley	B.S.		1	May 2019
39	Breaux, Jonathan	Jackson State University	B.S.		1	May 2019
40	Meredith, Melissa	California State University, Monterey Bay	B.S.		1	May 2019
41	Murphy, Elizabeth	University of Texas Rio Grande Valley	M.S.		1	December 2019
42	Young, Riley	California State University, Monterey Bay	B.S.		3	May 2020

## 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 collaboration with NOAA and in part through NERTOs. In-person research experiences and conference travel were restricted during this reporting period due to COVID-19, but NOAA CCME scholars and faculty were productive in publishing 14 works and submitting 3 additional papers.

- During this reporting period, NOAA CCME students authored or co-authored two papers published to peer-reviewed journals (with three additional submitted for review), one book chapter, two conference papers, and four theses. Additional publications by NOAA CCME faculty (including postdocs) included: three journal articles, one book edited, and one book chapter.
- During this reporting period, NOAA CCME had one oral student presentation and a OneNOAA seminar presented by a postdoctoral scholar (both virtual due to COVID-19 travel restrictions).
- One student participated in NERTO at NOAA/OAR/AOML during this reporting period developing new analyses and data products contributing to the host facility's research.
- NOAA CCME faculty generated \$888,500 in leveraged funding to provide expanded research and education opportunities to students. This includes a newly awarded project funded by NOAA Planet Stewards to facilitate summer research experiences for undergraduate students working with living shoreline projects. This will involve four NOAA CCME institutions (FAMU, B-CU, CSUMB, and UTRGV) and several external collaborators, including members of the Community Stakeholder Advisory Board.

## NOAA CCME Objective 3. CSC Administration

- NOAA CCME held its annual meeting virtually in August 2020, with participants from NOAA EPP, NOAA CCME PIs, affiliated faculty and students, other NOAA scientists, the NOAA CCME External Evaluator, and members of the Science Advisory Council and Community Stakeholder Advisory Board. The full list of speakers with presentation videos may be found on the NOAA CCME website at <http://ccme.famu.edu/2020-annual-meeting>.
- NOAA CCME held Center-wide monthly virtual meetings with Focal Area Leads and Institutional P.I.'s reporting on activities and student progress. Also during these calls, Education and Social Science Leads reported on student development, incorporation of social and human dimensions into student research projects, and planning for the Center-Wide Core Competency Course.



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- 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 participated in the NOAA CCME 2020 Annual Meeting. The compositions of the Science Advisory Council and Stakeholder Advisory Board were changed due to members stepping down and to increase participation (Appendix B). Members of the Council and Board have actively collaborated with NOAA CCME on student research and development of new research projects.
- NOAA CCME Director Dr. Larry Robinson participated in the Center Champions Working Group (CCWG) on August 12, 2020.
- NOAA CCME submitted a proposal to NOAA EPP for a ceiling increase for Year 5 to address impacts of COVID-19 on NOAA CCME scholars.
- NOAA CCME held meetings with the External Evaluator to review findings, recommendations and virtual site visits (see Appendix C).

## Looking to Year 5

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

- NOAA CCME has recruited a new cohort of students to start in September 2020. Recruitment efforts are taking place in anticipation of additional Year 5 funding 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, identification of suitable candidates enrolled at the partner institutions, as well as individual recruitment efforts at locally affiliated community colleges.

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

- At this time, several NOAA CCME scholars have NERTOs that have been delayed due to COVID-19. Two scholars are scheduled to begin virtual NERTO in September, 2020. Six scholars have applied for SSIOs and will adapt or delay NERTO plans with their mentors as the COVID-19 situation evolves. NOAA CCME will identify NOAA mentors and develop SSIOs for the remainder of the currently-enrolled graduate scholars.
- Work is ongoing to develop the curriculum for the next NOAA CCME Center-Wide Core Competency Course, planned for Spring 2021 in Monterey, CA. The course materials will include online modules and in-person activities (depending on evolution of the COVID-19 situation). At this time travel in California remains restricted due to COVID-19.
- Thirty additional NOAA CCME Scholars are expected to graduate prior to the end of Year 5.

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**NOAA CCME Objective 2. Research**

- NOAA CCME will develop a revised technical program for the delayed 10<sup>th</sup> Biennial NOAA EPP/MSI Education and Science 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 will take place during Year 5 (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 Year 5.
- New research projects for recently recruited scholars will be developed in collaboration with NOAA scientists. Synopses for these research projects will be presented to NOAA CCME and reviewed prior to approval.

**NOAA CCME Objective 3. CSC Administration**

- NOAA CCME will have its Fourth-Year Review virtually in September, 2020. This review was delayed due to the COVID-19 pandemic (Section VI).
- NOAA CCME will hold an annual meeting prior to the end of Year 5 at a time and location TBD.
- NOAA CCME will submit reports as required by the award.
- NOAA CCME anticipates replacing the NOAA CCME TAMU-CC Institutional PI following his retirement.

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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  
Erin Easton, Ph.D., University of Texas Rio Grande Valley

*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:

- **Held its Annual Meeting -**  
NOAA CCME held its Annual Meeting virtually on August 3-4, 2020. The meeting featured presentations by Center personnel, NOAA EPP, Center collaborators, Center scholars, and a number of NOAA scientists to foster future collaborative opportunities. Notable for this annual meeting was the increased participation of NOAA CCME scholars through oral presentations and participation in a moderated panel. The meeting also provided NOAA CCME the opportunity to plan Year 5 activities including the upcoming CWCC.
- **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 76 students and 1 postdoctoral scholar 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.

### Significant Results:

During this reporting period, NOAA CCME:

- **Had student research published in two peer-reviewed articles, two book chapters, two conference papers, and four theses –**  
Three additional student-authored papers were submitted for review. All publications are detailed in Section II.
- **Secured \$888,500 in leveraged funding for enhanced research opportunities for scholars at the partner institutions –**  
This funding is detailed in Section VIII. Financial Information.

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- **Had one scholar participate in NERTOs, with eight more scholars developing SSIOs with their NOAA mentors –**  
These NERTOs are described below in the summary of NOAA CCME Areas of Focus.
- **Had one postdoc participate in a NOAA internship –**  
CCME Postdoc Dr. Emily Jones completed her one-year internship with Jennifer Doerr (NOAA NMFS/SEFSC Galveston, TX).

**Key outcomes or other achievements:**

During this reporting period, NOAA CCME:

- **Trained 76 active students –**  
NOAA CCME Students and their statuses are detailed in Appendix A (Table 1).
- **Graduated 13 students (9 BS, 4 MS) –**
  - **Watson, KiAnna**, BS, Chemistry, NOAA CCME B-CU
  - **Rolle, Shaquila**, BS, Environmental Studies, NOAA CCME FAMU (currently applying for graduate programs)
  - **Bruce, Terrius**, BS, Environmental Studies, NOAA CCME FAMU (M.S. biology student at FAMU)
  - **Pavlock-McAuliffe, Miya**, MS, Marine Science, NOAA CCME CSUMB (Coastal Morphology Specialist at PolArctic, LLC)
  - **Young, Riley**, BS, Marine Science, NOAA CCME CSUMB
  - **Vaughn, Natalie**, BS, Marine Science, NOAA CCME CSUMB
  - **White, Miranda**, BS, Environmental Science, NOAA CCME B-CU (NOAA CCME M.S. student at B-CU)
  - **Jones, Kennedy**, BS, Biology, NOAA CCME JSU
  - **Vance, Miracle**, BS, Biology, NOAA CCME JSU
  - **Navarro, Javier**, MS, Ocean Coastal and Earth Sciences, NOAA CCME UTRGV
  - **Thomsen, Alexandra**, MS, Environmental Science, NOAA CCME CSUMB (working at Elkhorn Slough National Estuarine Research Reserve)
  - **Simpson, Queriah**, MS, Environmental Science, NOAA CCME FAMU (currently applying for graduate programs)
  - **Gonzalez, Edith**, BS, Biology, NOAA CCME UTRGV

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- **Recruited 13 additional scholars including one continuing in the educational pipeline** – NOAA CCME added 4 scholars pursuing Bachelor’s degrees, 8 Master’s students, and 1 Ph.D. scholar. NOAA CCME B-CU scholar Miranda White graduated with her BS and is continuing within NOAA CCME as a Master’s student.
  
- **Had 15 current or graduated student scholars and 1 former postdoc 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 highlights, former NOAA CCME graduate scholar Alexandra Thomsen began employment at the Elkhorn Slough National Estuarine Research Reserve and former NOAA CCME postdoctoral scholar Dr. Erin Easton was hired as an assistant professor at the University of Texas-Rio Grande Valley. Another NOAA CCME graduate, Miya Pavlock-McAuliffe, began working for PolArctic LLC, an oceanographic and data science company, as a coastal geomorphologist, a field closely related to her thesis work. Fall 2019 NOAA CCME scholar Meghan Martinez was awarded the NOAA Coastal Management Fellowship and will be working at the California State Coastal Conservancy on a project entitled “Implementing and Evaluating Efforts to Increase Coastal Wetland Resilience in Southern California”.
  
- **Had undergraduate scholars engaged in relevant summer internships** –
  - **Aaliyah Brown**, NOAA CCME FAMU, participated in the internship program College of Science and Technology Frontiers of STEAM: Thought Leaders
  - **Rhamira Corbett** NOAA CCME FAMU, was a Leadership Intern for Environment Florida
  - **Robert McKenzie**, NOAA CCME B-CU, participated in the KLXS-III Internship at the Kennedy Space Center.
  - **Andria Miller**, NOAA CCME JSU, participated in the Summer Undergraduate Research Fellowship in Oceanography (SURFO) Program at University of Rhode Island Graduate School of Oceanography. Her project was entitled: Dynamics of the plankton community structure in bodies of water in Mississippi.
  - **Mario Molina**, NOAA CCME UTRGV, participated in a summer internship with Texas Parks and Wildlife.
  
- **Had scholars receive awards for their outstanding academic and research performance** –
  - **Carlos Ray**, NOAA CCME FAMU, was awarded a scholarship from the Byron and Mildred Sprangler Fund
  - **Katia Sanchez**, NOAA CCME UTRGV, received a Student Ambassador Fall 2020 Award- Engaged Scholarship and Learning Program Silver Award
  - **Devin Comba**, NOAA CCME TAMUCC, was awarded a Coastal Conservation Association Scholarship
  - **Jordana Cutajar**, NOAA CCME TAMUCC, received a Texas State Aquarium Endowed Scholarship in Biodiversity and Conservation Science.

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- **Mariana Leon Perez**, NOAA CCME TAMUCC, received a Maggie Bains Endowed Scholarship
  - **Molly McBride**, NOAA CCME TAMUCC, received a Coastal Conservation Association Texas Scholarship.
  - **Alyssa Outhwaite**, NOAA CCME TAMUCC, received a Maggie Bains Endowed Scholarship.
  - **Lily Walker**, NOAA CCME TAMUCC, received a CCA/Shimano National Marine Science Scholarship.
  - **Kylee Lewis**, NOAA CCME TAMUCC, received a Texas State Aquarium Endowed Scholarship in Memory of Dr. Wes Tunnell.
- **Had scholars participate in a large number of leveraged research and training activities including:**
    - Technical training webinars
      - The National Marine Sanctuaries Webinar Series: Empowering Young Water Scientists with EarthEcho Water Challenge
      - Gas Chromatography and Gas Chromatography/Mass Spectrometry analysis webinar
      - High Performance Liquid Chromatography & Liquid Chromatography/Mass Spectrometry webinar
      - Microscope and phytoplankton ID training
      - SIMMR Course in R for stable isotope analysis class
      - 2020 ESRI User Conference Webinar
      - PRIMER-e Statistical workshop
      - NASA Applied Remote Sensing Training Program Remote Sensing of Coastal Ecosystems
    - NOAA and CSC webinars
      - NOAA NCAS-M Webinar: Resume Relaunch
      - NOAA CSC webinar “NERTO Success Stories”
      - NOAA National Weather Service webinar “Southern Texas Drought and Weather Outlook”
      - National Marine Sanctuaries Webinar Series: “Earth is Blue: Educational Videos about your National Marine Sanctuaries”
      - NOAA Webinar: Advances in Nature Based Methods of Shoreline Stabilization
      - NOAA Webinar: Exploring the Depths of National Marine Sanctuary of American Samoa
      - NOAA webinar “Evolving Challenges in Fisheries Science (and How We Are Tackling Them)”
      - National Marine Sanctuaries webinar “Exploring for Black Corals in Flower Garden Banks National Marine Sanctuary”
      - OneNOAA Science webinar “Exploring Coral Spawning in Flower Garden Banks National Marine Sanctuary with Exploring by the Seat of your Pants”



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- OneNOAA Science webinar “Living shipwrecks: creating 3D visualization for fish and reefs with echosound data”
- NCAS-M webinar “Ways to Construct and Format a Research Presentation”
- the NOAA RESTORE Science Program webinar “Effects of nitrogen sources and plankton food-web dynamics on habitat quality for the larvae of Atlantic bluefin tuna in the Gulf of Mexico”
- NOAA CCME Annual Meeting virtual presentations
- Other scientific webinars and meetings
  - ACF River Basin Drought Assessment by Florida Climate Center
  - Virtual Blue Decade webinar “The Great Atlantic Sargassum belt: The new golden floating rainforest?”
  - SECOORA webinar “Coastal 3-D high-resolution maps for floods, wetlands, and biodiversity”
  - University of Florida Innovation Coastal Resilience Summit
  - United States Aquaculture Society, National Aquaculture Association, and Alabama Cooperative Extension System webinar “Perceptions of Marine Aquaculture: How can we take back the narrative?”
- Professional development training
  - Texas A&M University System online course Information Security Awareness
  - US Office of Personnel Management webinar Navigating USAJOBS
  - NOAA Environmental Leadership: The Opportunity Imperative
  - SACNAS Webinar “How to Give Effective Online Presentations”
  - BoatUS Boater Safety Training Course
  - SACNAS webinar “Interview Screening and Live Q&A with Rosalyn LaPier”
- **Had postdoctoral scholar Dr. Emily Jones complete her postdoctoral position with NOAA CCME in August 2020 –**
  - **Dr. Emily Jones** completed her NOAA Postdoctoral Internship with Jennifer Doerr and Jennifer Leo from NOAA Southeast Fisheries Science Center conducting ecological studies in salt marsh and mangrove habitats in the northern Gulf of Mexico. Dr. Jones’ research was impacted by COVID-19 restrictions during the spring and summer and her funding was extended through August 2020. Dr. Jones submitted her final report “Impacts of mangrove expansion into Northern Gulf of Mexico salt marshes”.
- **Expanded collaboration with other CSCs and MSIs –**
  - NOAA CCME Distinguished Research Scientist Dr. Steve Morey began hosting a regular monthly meeting with Distinguished Research Scientists from the other three CSCs to share best practices, identify potential research opportunities, and develop plans for convening scientific sessions at upcoming conferences.
  - NOAA CCME Education Expert Dr. Bernadette Kelley began hosting a regular monthly meeting with the Education teams from the other CSCs to share ideas for educational

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and professional development activities. This group now hosts a monthly CSC education seminar series in which CSC students have presented.

## 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;
  - 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
- Prepared final synopses of completed research
- Participation in and presentation at seminars, workshops, meetings, and conferences
- Participation in the NOAA CCME Center-Wide Core Competency Course (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:**

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

*Coastal Resilience*

- The CR focal area had a total of 8 graduate students during this reporting period: 2 Ph.D. and 6 M.S. (For all focal areas, these numbers include students who were supported during this reporting period as well as those whose funding has run out but are still continuing to work toward their degrees. Additionally, some B.S. students also conduct research aligned with the focal areas.) One of the CR M.S. students graduated during this reporting period.

*Coastal Intelligence*

- The CI focal area has a total of 14 graduate students during this reporting period: 4 Ph.D. and 10 M.S. Two M.S. and Ph.D. students were added to the CI focal area during this reporting period. One M.S. student in CI graduated during this reporting period.

*Place-Based Conservation*

- The PBC focal area has a total of 16 graduate students during this reporting period: 5 Ph.D. and 11 M.S. Two PBC M.S. students graduated during this reporting period.

**3. Student synopses:** In addition to their written synopses, Scholars also present their synopses during Focal Area Monthly Calls. These calls are attended by NOAA CCME faculty, including the Social Science Lead, and members of the Science Advisory Council and Community Stakeholder Advisory Board who provide recommendations.

- Seven CCME graduate students presented synopses during this reporting period (For a list of all approved synopses, see Appendix A Table 1):
  - **Summer Martinez** (CR): Growth Response of *Pleurotus ostreatus* to Petroleum Crude Oil with Co-metabolite Amendments
  - **Elizabeth Harris** (CI): Multiple Stressors: Interaction between freshwater inflow and contaminants on toxicity of estuarine organisms
  - **Liyah Smith** (CI): Characterization of the prokaryotic epibionts of *Gammarus tigrinus*
  - **Caroline Rodriguez** (CI): Predicting Reef Resilience: Transforming Photomosaics into Coral Demographic Models
  - **Ryan Rubino** (PBC): Effects of Longline Oyster Cage Aquaculture on Seagrass Ecosystems In Copano Bay, Texas
  - **Elena Flores** (PBC): Effects of Nutrient Enrichment on Mangrove and Saltmarsh Habitats
  - **Devin Comba** (PBC): Advancing oyster reef restoration projects: comparing functions of different habitats and addressing the use of plastic in small-scale restoration

**4. Student NERTO updates (Appendix A Table 1)**

- NOAA CCME scholar David Lecusay (PBC) participated in his NERTO “Developing a Structural and Functional Multimetric Index for Assessing Estuarine Ecological Condition” with Dr. Chris Kelble at NOAA OAR AOML during this reporting period.

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- SSIOs for five additional NOAA CCME scholars' NERTOs were submitted and approved during this reporting period:
    - **Victoria Salinas** (PBC), “Developing propagation techniques for the black wire coral, *Stichopathes lutkeni*”, Dr. Cheryl Woodley, NOAA NOS NCCOS. Planned for spring 2021.
    - **Elena Flores** (PBC), “Assessing nutrient levels in black mangrove habitats and potential effects on the distribution and composition of estuarine nekton species assemblages in a changing salt marsh-black mangrove landscape”, Jennifer Doerr, NOAA NMFS SEFSC Galveston. Planned for spring 2021
    - **Summer Martinez** (CR), “Growth Response of *Pleurotus ostreatus* to Petroleum Crude Oil with Nutrient Amendments”, Dr. Edward Wirth, NOAA NOS NCCOS. Planned for spring 2021.
    - **Joshua Rigo** (CI), “Rip Current Image Analysis and Model Validation”, Dr. Michael Churma, NOAA NWS. Planned for fall 2020 (virtual).
    - **Willis Lyons** (CR), “Utilizing Social Marketing Tools and Theories to Support Protected Species Management”, Allison Rosner, NOAA NMFS Greater Atlantic Regional Office. Planned for fall 2020 (virtual).
  - Four other scholars have had applications for NERTOs accepted but are delaying their starting dates. These include:
    - **Abraham DaSilvio** (PBC), “Investigating the connection between water quality and coral health”, Dr. Chris Kelble, NOAA OAR AOML.
    - **Elizabeth Harris** (CI), “Ecotoxicology Assessment of Climate and Pesticide Interactions in Estuarine Systems”, Dr. Marie DeLorenzo, NOAA NOS NCCOS.
    - **Lily Walker** (CI), “Eutrophication, shellfish aquaculture, and bioextraction: ecosystem”, Dr. Suzanne Bricker, NOAA NOS NCCOS.
    - **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.
5. Research Accomplishments – Outcomes and outputs of NOAA CCME graduate student research are now reported to the Focal Areas through a new Final Synopsis requirement. The following are summaries of the Final Synopses submitted during this period.
- **Queriah Simpson** (CI). - The goal of this research was to contribute to the development of Habitat Suitability Models for deepwater corals along the West Florida Escarpment in support of a NOAA OER-funded project. In addition to working with the NOAA NCCOS team on technical aspects of the models, an objective was to present a framework for potential application of habitat suitability models to bioprospecting. Data from numerical hydrodynamic models and environmental data were interpolated to a fine-scale grid. Habitat suitability models were developed based on statistical analyses of various environmental predictor variables and observations of presence and absence of corals.

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Specific NOAA datasets used include: NOAA NOS Multibeam bathymetry, NOAA Deep-Sea Coral and Sponge Data Portal, NOAA NCEI World Ocean Database.

This research contributed to the development of new habitat suitability models for deep-sea corals along the west Florida Escarpment that, in particular, had the novel approaches of including records of coral absence (in addition to presence) and using currents simulated by a hydrodynamic model. This project developed habitat suitability models for *Isididae*, *Stichopathes*, and *Antipathes* along the west Florida Escarpment. The datasets and tools are being used by the OER-funded project team and within the NOAA/NOS/NCCOS Biogeography branch.

- **Javier Navarro** (PBC) - The goal of this experiment was to explore and understand the multifaceted facilitative interaction between saltwort and black mangrove seedlings and derive implications as a restoration tool. Three objectives were followed. The first was to assess the effects of saltwort on microclimate (light intensity, soil and air temperatures) and soil parameters (redox potential, nutrient availability, pH, electrical conductivity, carbon content). The second objective was to confirm that propagules become stranded in saltwort more readily than on bare mud and those stranded also survive in greater numbers. The final objective was to determine if overall seedling growth responses, health and survival were increased when grown in the presence of saltwort. A series of field experiments in a fringe mangrove stand were developed over two years. These experiments include a randomized stratified design establishing plots with planted and existing saltwort and planted seedling and propagules. Also, a paired seedling experiment was established with naturally existing seedlings.

The interaction between saltwort and mangrove seedlings was explored. It was concluded that this interaction can be classified as commensalism, it clearly and critically promotes the establishment and initial growth of black mangrove seedlings in various ways. These include a large positive effect of saltwort on the physical stranding of mangrove propagules. Propagule stranding in saltwort covered plots was 17 times greater than stranding in bare mud. Saltwort seems to reduce anoxic soil conditions and moderates soil temperature, thus ameliorates root growth conditions. Aboveground, saltwort moderates light intensity and air temperature, thus improving microclimatic conditions for mangrove seedlings. The most noticeable plant response was a higher seedling survival within saltwort patches. Growth was enhanced but only slightly. Planted saltwort had little effects on the microenvironment and plant responses, compared to naturally existing and more dense saltwort. Mangrove reforestation efforts could benefit from the use of dense saltwort as the best location for mangrove seedling transplantation or propagules spreading.

- **Mallory Brooks** (CR) – The goal of this research was to determine the effectiveness of employed living shorelines compared with turf grass dominant sites in the Mosquito Lagoon and its watershed at decreasing the amount of pollution entering the waterbody from runoff and incorporating private and publicly owned waterfront properties into coastal resilience projects to improve water quality and ameliorate negative impacts of surface runoff. Compared a softened shoreline technique, known as living shorelines, utilizing native Florida plants, including (*Pontederia cordata*, *Sagittaria lancifolia*, *Canna flacida*,

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*Juncus effuses*, *Spartina bakeri*, *Spartina alterniflora*, *Spartina patens*) against the common developed waterfront technique of hardened shoreline with a turf grass lawn. Their structural complexity and effectiveness at removing nutrients and suspended solids from surface runoff was tested by employing 15 living shorelines in the Mosquito Lagoon, Florida and nearby coastal retention ponds compared against 15 turf grass control sites. Surface water, Simulated Rain Event (SRE) water, and vegetative indexes associated with nutrient sequestration were monitored for the two years (2017 and 2018) post-construction. The SRE device was used to replicate surface runoff in the study and was later evaluated on set-up, sample collection, processing, and overall use to assist with future research. Throughout the project, homeowners, city officials and other entities involved in the study were assessed on their viewpoints, actions, and personal preferences surrounding living shorelines, native plants, and “Florida-friendly” yard practices.

These results assist with the confirmation that living shorelines’ effectiveness is time-dependent. However, the native planted shorelines utilized during this study were often altered damaged by homeowners, yard maintenance companies, or natural disasters (Hurricane Irma (2017) and Hurricane Michael (2018)). Throughout the project, improvements that could be made to the SRE were noted and suggestions made for future researchers. Waterfront homeowners at the turfgrass control sites and the native planted sites were assessed on their demographics, knowledge, and behavior, while other factual qualities of their home location were noted and assessed.

- **Miranda White (PBC)** – The goal of this research was to evaluate the efficiency of living shorelines at mitigating the impacts of nonpoint source pollution and surface runoff in waterfront public and private (residential) properties within an estuarine watershed, called the Mosquito Lagoon Watershed. Surface water quality and vegetation indices were compared between the 15 living shoreline sites and 15 predominantly turf grass control sites along the shores within the lagoon watershed. To compare the effectiveness in nutrient sequestration and nonpoint source pollution reduction between the sites utilizing living shorelines and control sites, surface water quality and plant parameters were monitored quarterly from August of 2017 and December of 2019.

TKN and TKP concentrations found at the living shoreline sites was observed to have lower concentrations than the TKN and TKP concentrations at the control sites after 2 years of planting the native marsh vegetation. The native vegetation that was planted at the living shoreline sites had higher plant height, which would be an indirect indication of better sequestering nutrients than the turf grass. While a majority of the living shoreline vegetation grew steadily throughout the three-year project (mean canopy height above 75 cm at the end of 2019), mean plant height for turf grass remained around 14 cm due to consistent lawn mowing and manicuring completed by either resident of the private property or public maintenance, which releases the stored nutrients back into the lagoon or retention pond systems. The short-mowed and continuous nature of turf grass is a contributing factor for this difference.

- **Alexandra Thomsen (PBC)** – The goal of this research was to better understand the success of restoring a degraded, subsided West Coast marsh using sediment addition in

order to inform adaptive management and planning of future sites. Objectives included (1) quantifying survival of buried vegetation, (2) understanding which species can colonize naturally, and which may be dispersal-limited and unable to colonize on their own, (3) understanding the environmental factors that explain variation in naturally-colonized vegetation cover, in order to characterize areas where restoration was most successful early on, and (4) testing the applicability of unmanned aircraft systems (UAS) for monitoring vegetation during the early stages of marsh restoration.

This research was conducted at a restoration site in Elkhorn Slough, Central California, USA. To quantify survival of buried vegetation, the student conducted area searches of surviving plants within the first few months following construction of the restoration site and compared the estimated area of surviving plants with the vegetated area digitized from pre-restoration UAS imagery. Results show that less than 1% of plants survived the restoration construction process, likely due to the heavy construction equipment used to place sediment. Most natural colonization was by the Pacific Coast marsh dominant pickleweed (*Salicornia pacifica*), with some colonization by other native marsh species (*Frankenia salina* and *Spergularia marina*). Other native species found in Elkhorn Slough did not recruit naturally in substantial numbers and may be dispersal-limited. Elevation was the best environmental predictor of vegetation cover for both the UAS- and field-collected vegetation data, with more plant cover at higher elevations that were tidally-inundated <0.85% of the time during the first year. Similar modeling results for UAS- and field-collected data indicated that both methods were appropriate for monitoring early vegetation at this site, and the combination of both types of data enabled analysis of a wide variety of predictors.

### III. Products of Award

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

#### Degrees Awarded:

1. **Watson, KiAnna**, BS, Chemistry, NOAA CCME B-CU
2. **Rolle, Shaquila**, BS, Environmental Studies, NOAA CCME FAMU
3. **Bruce, Terrius**, BS, Environmental Studies, NOAA CCME FAMU
4. **Pavlock-McAuliffe, Miya**, MS, Marine Science, NOAA CCME CSUMB
5. **Young, Riley**, BS, Marine Science, NOAA CCME CSUMB
6. **Vaughn, Natalie**, BS, Marine Science, NOAA CCME CSUMB
7. **White, Miranda**, BS, Environmental Science, NOAA CCME B-CU
8. **Jones, Kennedy**, BS, Biology, NOAA CCME JSU

9. **Vance, Miracle**, BS, Biology, NOAA CCME JSU
10. **Navarro, Javier**, MS, Ocean Coastal and Earth Sciences, NOAA CCME UTRGV
11. **Thomsen, Alexandra**, MS, Environmental Science, NOAA CCME CSUMB
12. **Simpson, Queria**, MS, Environmental Science, NOAA CCME FAMU
13. **Gonzalez, Edith**, BS, Biology, NOAA CCME UTRGV

### Student Publications in Journals:

*Only publications with NOAA CCME award attribution are included.*

\*NOAA CCME Student, \*\*NOAA CCME Faculty, \*\*\*NOAA Collaborator, NOAA CCME students and postdocs are in **bold**

Ibrahim O. F., **W. O. Lyons\***, Z. Arslan, M. Tucci, H. Benghuzzi, T. Turner\*\*, and P. B. Tchounwou (2020). Natural Remediation of Microbial Contamination of Water from Estuarine Sources in Mississippi. *Biomed. Sci. Instru.* 56 (2). 375-382.

**León-Pérez\***, M., R. A. Armstrong, W.J. Hernández, A. Aguilar-Perera, and J. Thompson-Grim (2020) Seagrass cover expansion off Caja de Muertos Island, Puerto Rico, as determined by long-term analysis of historical aerial and satellite images (1950–2014). *Ecological Indicators*, 117, doi:0.1016/j.ecolind.2020.106561.

*Newly submitted and in review*

**Brooks\* M., M. White\***, H.J. Cho\*\*, A. Ho. (2020). Reviews and Lessons Learned: Guideline for Small-Scale Living Shorelines at Private Waterfront Properties. *Florida Scientist*, In Review.

**Murphy A.E.\***, Cintra-Buenrostro CE\*\*, Fierro-Cabo AF\*\* (2020). Identifying nitrogen source and seasonal variation in a Black Mangrove (*Avicennia germinans*) community, southwest Texas. *Aquatic Botany*, In Review.

**Walker, L.\***, P. Montagna\*\*, X. Hu, and M. Wetz (2020), Timescales and magnitude of water quality change in three Texas estuaries induced by passage of Hurricane Harvey, *Estuaries and Coasts*, In Review

### Faculty Publications in Journals:

**Easton. E.E.\*\***, Hicks, D.\*\* (2020). Complete mitogenome of *Carijoa riisei* (Octocorallia: Alcyonacea: Stolonifera: Clavulariidae). *Mitochondrial DNA Part. B.* 5, 1826–1827. <https://doi.org/10.1080/23802359.2020.1750998>

Rohal, M, N. Barrera, E. Escobar-Briones, G. Brooks, D. Hollander, R. Larson, P.A. Montagna\*, M. Pryor, I.C. Romero, P. Schwing (2020), How Quickly Will the Offshore Ecosystem Recover from the 2010 Deepwater Horizon Oil Spill? Lessons Learned from the 1979 Ixtoc-1 Oil Well Blowout, *Ecological Indicators*, doi 10.1016/j.ecolind.2020.106593



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Shropshire, T., S.L. Morey\*\*, E. Chassignet, A. Bozec, V. Coles, M. Landry, R. Swalethorp, G. Zapfe, and M. Stukel (2020). Quantifying spatiotemporal variability in zooplankton dynamics in the Gulf of Mexico with a physical-biogeochemical model. *Biogeosciences*, 17, 3385-3407, doi:10.5194/bg-17-3385-2020.

### Editor of Special Issues

None to report

### Books:

Cho\*\*, H.J., M.A. Reiter, C. Jacoby, B. Simmons, III, and R. Young, eds. (2020). The Halifax River Urban Watershed: A Holistic Approach to Sustainability. Bethune-Cookman University, 135pp.

### Book Chapters

Cho\*\*, H.J., **M. White\***, B. Tanner, S. Krejci\*\*, J. Calderon, D. Rojas-Torres, and J. Williams (2020). Physical Setting of the Halifax River and Its Watershed. In: The Halifax River Urban Watershed: A Holistic Approach to Sustainability (Eds. Cho et al.). Bethune-Cookman University, Daytona Beach, FL. p19-37.

Reiter, M.A. and H.J. Cho\*\* (2020). A Systems Approach to Sustainability in the Halifax River Urban Watershed (HRUW). In: The Halifax River Urban Watershed: A Holistic Approach to Sustainability (Eds. Cho et al.). Bethune-Cookman University, Daytona Beach, FL. p10-18.

### Thesis/Dissertations:

**Navarro, J.R.\*** (2020). Analysis of the facilitative interaction between *Batis maritima* and *Avicennia germinans* seedlings as a mangrove restoration strategy. Thesis. University of Texas Rio Grande Valley.

**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. [https://digitalcommons.csUMB.edu/aes\\_theses/3/](https://digitalcommons.csUMB.edu/aes_theses/3/)

**Simpson, Q.\*** (2020). Application of habitat suitability models for benthic communities in the eastern Gulf of Mexico: Linking bioprospecting and modelling research. Thesis. Florida Agricultural and Mechanical University.

**Thomsen, A.\*** (2020). Integrating field methods, remote sensing and modeling to monitor climate-adapted tidal marsh restoration. Thesis. California State University, Monterey Bay.

### Conference Papers, Posters and Presentations:

\*NOAA CCME Student, \*\*NOAA CCME Faculty, \*\*\*NOAA Collaborator, NOAA CCME students and postdocs are in **bold**

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*Conference Papers*

A. Hennad, **P. Cockett\***, L. McLauchlan and M. Mehrubeoglu (2019) Characterization of Irregularly-Shaped Objects Using 3D Structured Light Scanning, 2019 International Conference on Computational Science and Computational Intelligence (CSCI), 600-605, 10.1109/CSCI49370.2019.00113.

**Del Rosario\***, E. and T. Flowers\*\*\* (2020), Establishing Correlations in Reservoir Release Datasets: A Comparative Study between Texas and California, USA, Proceedings of the 2020 ASCE Watershed Management Conference, doi:10.31061/9780784483060.003.

*Posters and Oral Presentations*

**Easton, E. E.\*\***, Pavliska, C., Hicks, D.\*\* (2020). Revelations from mitogenome studies of western Gulf of Mexico octocorals. NOAA Deep Sea Coral Research and Technology Program webinar series. Archived at <https://deepseacoraldata.noaa.gov/library/deep-sea-coral-seminars>.

**Lascelles, N.\*** (2020). Characterization of microplastics by using a novel method of pyrolysis GC-MS. NOAA EPP/MSI – Cooperative Science Center Education Webinar Series.

**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**

None to report

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

Lecusay, D. Multimetric indices for assessing the Barataria Basin ecosystem status. Developed during NERTO “Developing a Structural and Functional Multimetric Index for Assessing Estuarine Ecological Condition”, NOAA/OAR/AOML, 2020.

## 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
<b>Larry Robinson, PhD</b>	Director/Principal Investigator	10
<b>Michael Abazinge, Ph.D.</b>	Associate Director	10
<b>Sharmini Pitter, Ph.D.</b>	Assistant Director	160
<b>Bernadette Kelley, Ph.D.</b>	Education Expert	20
<b>Sherry Wells</b>	NOAA CCME Coordinator	160
<b>Emily Jones, Ph.D.</b>	Postdoctoral Research Associate	160
<b>Steve Morey, Ph.D.</b>	Distinguished Research Scientist	160
<b>Kris Suchdeve</b>	Data and Communication Manager	160
<b>Richard Long, Ph.D.</b>	Co-PI, Coastal Intelligence Co-Lead	26
<b>Phyllis Gray-Ray, Ph.D.</b>	Social Science Lead	42
<b>Charles Jagoe, Ph.D.</b>	Faculty advisor	N/A, not budgeted under the award
<b>Elijah Johnson, Ph.D.</b>	Faculty advisor	N/A, not budgeted under the award
<b>Michael Martinez-Colon, Ph.D.</b>	Faculty advisor	N/A, not budgeted under the award
<b>Hongmei Chi, Ph.D.</b>	Big Data Lead	26
<b>Richard McLaughlin, Ph.D.</b>	Principal Investigator	29
<b>David Yoskowitz, Ph.D.</b>	Co-principal Investigator	21.7
<b>Paul Montagna, Ph.D.</b>	Co-principal Investigator	21.7
<b>James Gibeaut, Ph.D.</b>	Co-principal Investigator	21.7
<b>Greg Stunz, Ph.D.</b>	Co-principal Investigator	21.7
<b>Jennifer Pollack, Ph.D.</b>	Faculty advisor	N/A, not budgeted under the award
<b>Michael Wetz, Ph.D.</b>	Faculty advisor	N/A, not budgeted under the award
<b>Mikell Smith</b>	TAMUCC NOAA CCME Coordinator	139
<b>J. Cho, Ph.D.</b>	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
<b>Corey Garza, Ph.D.</b>	co-principal Investigator	40 hrs/mo, two weeks in summer, rest is leveraged.
<b>Laura Good, Ph.D.</b>	Education Liaison	20
<b>Cheryl Logan, Ph.D.</b>	CSUMB mentor	N/A, not budgeted under the award
<b>Alison Haupt, Ph.D.</b>	CSUMB mentor	N/A, not budgeted under the award
<b>James Lindholm, Ph.D.</b>	CSUMB mentor	N/A, not budgeted under the award
<b>John Goeltz, Ph.D.</b>	CSUMB mentor	N/A, not budgeted under the award
<b>Ivano Aiello, Ph.D.</b>	Moss Landing mentor	N/A, not budgeted under the award
<b>Tim Turner, Ph.D.</b>	Principal Investigator	5
<b>Paul Tchounwou, Ph.D.</b>	Co-Principal Investigator	1
<b>Paulette Bridges</b>	Program Manager	24
<b>Ibrahim Farah, Ph.D.</b>	Co-Investigator	Funded during the summer months
<b>Fenxiang Han, Ph.D.</b>	Co-Investigator	Funded during the summer months
<b>Ranjani Kulawardhana, Ph.D.</b>	Co-Investigator	Funded during the summer months
<b>Brent Thoma, Ph.D.</b>	Co-Investigator	Funded during the summer months
<b>Carlos Cintra, Ph.D.</b>	Co-Investigator	50
<b>Owen Temby, Ph.D.</b>	Co-Investigator	50
<b>Erin Easton Ph.D.</b>	Postdoctoral Research Associate	50
<b>David Hicks Ph.D.</b>	Principal Investigator	50
<b>John Breier Ph.D.</b>	Co-Investigator	Leveraged, not budgeted during time frame
<b>Alejandro Fierro Ph.D.</b>	Co-Investigator	50
<b>Leticia Contreras</b>	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*

<b>Type of Partner Organization:</b>	<b>Organization Name:</b>	<b>Partner's Contribution to NOAA CCME</b>
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*

<b>Type of Partner Organization:</b>	<b>Organization Name:</b>	<b>Partner's Contribution to NOAA CCME</b>
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**

<b>NOAA Mentor Name</b>	<b>NOAA Facility</b>	<b>CCME Scholar Name</b>	<b>Description of Collaboration</b>
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)
Chui, Emily	CSUMB College of Science (Program Assistant)
Del Angel, Diana	Florida Department of Environmental Protection
Destafano, Antoinette	Bethune-Cookman University (Research Scientist)
Eddy, Taylor	USGS (Biologist)
Guruvadoo, Shan	Channel Logistics (dba Space Eyes) (Data Scientist)
Madrid, Cristina	Texas Economic Development-Governor’s Business and Community Development Division (Research Specialist)
Martinez, Meghan	California State Coastal Conservancy (NOAA Coastal Management Fellow)
Murphy, Ashley (Elizabeth)	West Virginia Department of Environmental Protection (Environmental Resource Specialist)
Mwenda, Samuel	State of Florida
Pavlock-McAuliffe, Miya	PolArctic LLC (Coastal Morphology Specialist)
Thomsen, Alexandra	Elkhorn Slough National Estuarine Research Reserve

## 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?**

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A total of 110 students (pursuing 118 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 41 students earning 42 degrees (29 B.S. and 13 M.S./M.A.), including 13 (9 B.S. and 4 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 Section II), 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 Spring 2020 semester.

NOAA CCME has increased the number of students educated and graduating with degrees in NOAA mission-related disciplines (13 degrees were awarded during this reporting period). In addition to the professional development opportunities detailed in Section II, one graduate scholar participated in his NERTO at a NOAA facility during this reporting period. Student research was disseminated in five peer-reviewed journal articles, one book chapter, two conference papers, four theses, and one seminar.

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 12 scholars from URM communities, bringing the Center total number of degrees awarded to students from URM communities to 37 (Executive Summary Table 1a). As detailed in Section I, fifteen 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?**

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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.

Former NOAA CCME postdoctoral scholar Dr. Erin Easton was hired in a tenure-track position at UTRGV at the start of Fall 2020. Dr. Easton is now an affiliated faculty of NOAA CCME and will continue to be engaged in Center education, training, and research. Additionally, former NOAA CCME undergraduate scholar Emily Chui was hired as a Program Assistant at the CSUMB College of Science where she participates in NOAA CCME recruitment and outreach activities.

NOAA CCME faculty were additionally awarded \$888,500 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. Additionally, the societal impacts of completed student research are now reported to NOAA CCME through the Final Synopsis form, which is used for tracking these outcomes and to identify highlights for inclusion in Center media and communications. The impactful research by the Center is communicated to the scientific community through publications and presentations and to the larger community by participation of NOAA CCME scholars and

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faculty in outreach activities. 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 state capitols.

## 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 116 degrees, exceeding the recruitment goal (92 total degrees) through year 4.
  - Of the 116 degree-seeking students, 8 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:
    - 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)
    - Antoinette Destefano (M.S. student, BCU, personal reasons)
  - FAMU exceeded its recruitment goal for Bachelor's students (proposing 16 and recruiting 18) through Cohort 4. However, 5 FAMU Bachelor's students have left the program due to academic eligibility or personal reasons. FAMU will work to recruit three additional students transferring from a community college or in the junior or senior year to fill the remaining open slots in Fall 2020.
  - FAMU has recruited a total of 10 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 met its recruitment goal for M.S. students (8) but one left the Center early. BCU will recruit an additional M.S. student during Fall 2020. BCU has added 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 during Fall 2020 to complete the proposed number of M.S. students.
  - 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. TAMUCC has exceeded the proposed number of Ph.D. students, recruiting 9 and proposing 5.
  - UTRGV has exceeded its recruitment goal for Bachelor's students and M.S. students.
  - 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 carry forward funds during a no-cost extension period.
  - To increase participation and to replace members leaving their positions, the compositions of the NOAA CCME Science Advisory Council and Community Stakeholder Advisory Board have been changed (see changes detailed in Appendix B).

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

The COVID-19 pandemic has presented challenges during this entire semi-annual reporting period. NOAA CCME has been regularly communicating with NOAA EPP to develop plans to address these challenges.

- The 10<sup>th</sup> Biennial NOAA EPP/MSI Education and Science Forum, originally scheduled for 29 March – 1 April 2020, has been postponed. NOAA CCME worked with vendors to cancel or modify contracts. Registration refunds were issued as requested. Some funds will be irrecoverable (such as time spent by the event planner).
- The schedule for the Center Fourth-Year Review was postponed and is now scheduled to be held virtually for September, 2020.
- Travel restrictions prevented NOAA CCME from holding its annual meeting in-person at a NOAA facility. Therefore, NOAA CCME held its annual meeting virtually on August 3-4, 2020.
- Student NERTOs have been affected by travel restrictions. One NOAA CCME scholar traveled to Miami, FL, for his in-person NERTO with Dr. Chris Kelble at AOML in the days prior to widespread laboratory closures and travel restrictions being put in place. This NERTO was rapidly modified to accommodate remote participation. Feedback from the NERTO mentor and student indicated that this experience was successful. NOAA CCME will work with NOAA EPP, scholars, and the NOAA mentors on a case-by-case basis as modifications (e.g., teleworking or postponement) become necessary. At the time of this report, two NERTOs are scheduled for virtual participation beginning in September 2020 with six more NERTOs being delayed. If restrictions preventing in-person participation extend through the fall, some of these NERTOs will be adjusted for virtual participation. NOAA CCME will continue to develop projects and SSIOs for future NERTOs.

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- NOAA CCME scholars have all had to transition to remote learning at their institutions. No scholars have yet failed to meet eligibility requirements (full time, GPA, etc) due to these changes.
- Many NOAA CCME scholars conducting research have experienced delays due to laboratory closures and inability to travel to conduct field work. This has resulted in some scholars modifying their research plans but with others potentially needing to extend their time to graduation.

NOAA CCME submitted a proposal for a ceiling increase to Year 5 funding to address impacts of COVID-19 on students and research. The funding would be used to facilitate opportunities for remote training and research, additional financial support for scholars to alleviate financial hardships caused by the pandemic, and funding for students whose graduations and research were delayed.

**Changes that have a significant impact on expenditures:**

COVID-19 travel restrictions and laboratory closures have had an impact on expenditures over the past six months. Notably are students delaying participation in NERTOs, laboratory analyses, and field work. NOAA CCME postdoctoral scholar Dr. Emily Jones had substantial impacts from NOAA laboratory closures on her research and was therefore extended additional funding through August, 2020. It is anticipated that these impacts on expenditures, particularly delay of travel and research spending, will result in additional carry forward of year 4 funds.

## 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 for a summary of the External Evaluator activities during this period.

### 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 was also been substantially engaged in the planning of the NOAA EPP/MSI Tenth Biennial Education and Science Forum, which has been delayed due to the COVID-19 restrictions.

NOAA CCME collaborated with the other CSCs and NOAA EPP/MSI in planning the 10<sup>th</sup> 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 provided input for the technical program and abstract review process. The results of these actions will be used to streamline preparation of the rescheduled Forum.

The NOAA CCME Education Expert convenes a monthly meeting of the Education Experts from all four CSCs. This team has initiated a monthly CSC Education webinar series featuring student speakers. The NOAA CCME Distinguished Research Scientist



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convenes a monthly meeting with the DRSs from all four CSCs to discuss best practices, share research and mentorship opportunities, and plan joint-CSC chaired sessions at upcoming scientific conferences.

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.

An external review was to be conducted by NOAA and an independent expert external review team during the fourth year of the award. All required documents for the review were submitted prior to the start of this semi-annual reporting period. However, the in-person review was delayed due to the COVID-19 travel restrictions. This review is now scheduled to take place September 22-30, 2020 virtually.

Collaboratively with NOAA EPP/MSI, NOAA CCME was to host the Biennial NOAA EPP/MSI Education and Science Forum at the campus of Florida A&M University on March 29 – April 1. In the weeks prior to the Forum, the decision was made by NOAA EPP and NOAA CCME to postpone the forum due to the emerging COVID-19 pandemic. At this time, no new date for the Forum has been established.

## **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 as appropriate (some publication types such as book chapters are not accepted by the repository)

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**Participant Beneficiaries**

*Table 7: Direct Student Support disbursed during the reporting period.*

Direct Student Support disbursed during the reporting period								
	Student Name	NOAA CCME Partner Institution	Tuition	Stipend	Travel	NERTO	One-time research	Professional Development
1	Margarette Bayron-Arcelay	FAMU	\$4,628	\$10,500	\$0	\$0	\$0	\$0
2	Aaliyah Brown	FAMU	\$1,500	\$1,500	\$0	\$0	\$0	\$0
3	Terrius Bruce	FAMU	\$1,500	\$1,500	\$0	\$0	\$0	\$0
4	Alexis Hamilton	FAMU	\$1,500	\$1,500	\$0	\$0	\$0	\$0
5	Summer Martinez	FAMU-MS	\$4,794	\$9,304	\$0	\$0	\$0	\$0
6	Willis Lyons	FAMU	\$10,834	\$10,500	\$0	\$0	\$0	\$0
7	Tayler McKinnon	FAMU	\$2,130	\$1,500	\$0	\$0	\$0	\$0
8	Andrea Pugh	FAMU	\$4,668	\$9,918	\$1,584	\$0	\$0	\$0
9	Daryin Medley	FAMU	\$10,833	\$9,504	\$0	\$0	\$0	\$0
10	Shaquila Rolle	FAMU	\$150,000	\$1,500	\$0	\$0	\$0	\$0
11	Jordan Roberts	FAMU	\$1,500	\$1,500	\$0	\$0	\$0	\$0
12	Angelique Rosa-Marin	FAMU	\$4,428	\$7,890	\$0	\$0	\$0	\$0
13	Queriah Simpson	FAMU	\$4,428	\$9,504	\$0	\$0	\$0	\$0
14	Ariana Uwaibi	FAMU	\$4,328	\$10,500	\$0	\$0	\$0	\$0
15	Liyah Smith	FAMU	\$10,933	\$9,504	\$0	\$0	\$0	\$0
16	Josh Ringo	FAMU	\$1,860	1,583.00	\$0	\$0	\$0	\$0
17	Rhamira Corbett	FAMU	\$2,700	\$1,500	\$0	\$0	\$0	\$0
18	Carlos Ray	FAMU	\$5,632	\$1,500	\$0	\$0	\$0	\$0

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**Direct Student Support disbursed during the reporting period**

	<b>Student Name</b>	<b>NOAA CCME Partner Institution</b>	<b>Tuition</b>	<b>Stipend</b>	<b>Travel</b>	<b>NERTO</b>	<b>One-time research</b>	<b>Professional Development</b>
19	Ashley Lacey	FAMU	\$4,378	\$10,500	\$0	\$0	\$0	\$0
20	Brian Coogan	FAMU	\$1,500	\$1,500	\$0	\$0	\$0	\$0
21	Amonra Garrett-Mills	FAMU	\$1,500	\$1,500	\$0	\$0	\$0	\$0
22	Abraham DaSilvio	BCU	\$0	\$5,250	\$0	\$0	\$0	\$0
23	Gabrielle Watkins	BCU	\$0	\$462	\$0	\$0	\$0	\$0
24	Robert McKinzie	BCU	\$0	\$462	\$0	\$0	\$0	\$0
25	Shalaila Duke	BCU	\$0	\$923	\$0	\$0	\$0	\$0
26	Kianna Watson	BCU	\$0	\$1,723	\$0	\$0	\$0	\$0
27	Miranda White	BCU	\$0	\$5,250	\$0	\$0	\$0	\$0
28	Elena Flores	UTRGV	\$0	\$5,000	\$115	\$0	\$847	\$0
29	David Lecusay	UTRGV	\$0	\$7,500	\$0	\$0	\$1,566	\$0
30	Javier Navarro	UTRGV	\$505	\$3,750	\$0	\$0	\$0	\$0
31	Katia Sanchez	UTRGV	\$0	\$4,303	\$0	\$0	\$0	\$0
32	Rebekah Hernandez	UTRGV	\$469	\$5,000	\$0	\$0	\$0	\$0
33	Sandra Leal	UTRGV	\$1,281	\$7,500	\$0	\$0	\$0	\$0
34	Victoria Salinas	UTRGV	\$0	\$7,500	\$0	\$0	\$1,335	\$0
35	Mario Mlina	UTRGV	\$0	\$1,877	\$0	\$0	\$699	\$0
36	Juliet Vallejo	UTRGV	\$1,545	\$7,500	\$0	\$0	\$268	\$0
37	Edith Gonzalez	UTRGV	\$1,045	\$2,433	\$0	\$0	\$0	\$49
38	Asael Rodriguez	UTRGV	\$0	\$3,032	\$0	\$0	\$5,587	\$0
39	Natalie Uribe	UTRGV	\$0	\$1,733	\$0	\$0	\$0	\$0

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**Direct Student Support disbursed during the reporting period**

	<b>Student Name</b>	<b>NOAA CCME Partner Institution</b>	<b>Tuition</b>	<b>Stipend</b>	<b>Travel</b>	<b>NERTO</b>	<b>One-time research</b>	<b>Professional Development</b>
40	Patricia Cockett	TAMUCC	\$0	\$13,500	\$1,137	\$0	\$0	\$0
41	Devin Comba	TAMUCC	\$0	\$9,600	\$0	\$0	\$935	\$0
42	Jordana Cutajar	TAMUCC	\$1,604	\$9,600	\$712	\$0	\$0	\$0
43	Diana Del Angel	TAMUCC	\$1,604	\$11,000	\$554	\$0	\$55	\$0
44	Elizabeth Del Rosario	TAMUCC	\$1,426	\$13,200	\$696	\$0	\$298	\$0
45	Elizabeth Harris	TAMUCC	\$1,426	\$9,600	\$712	\$67	\$36	\$0
46	Nigel Lascelles	TAMUCC	\$1,188	\$12,000	\$712	\$0	\$3,268	\$0
47	Mariana Leon Perez	TAMUCC	1,504.00	\$13,200	\$1,010	\$0	\$3,186	\$0
48	Anthony Lima	TAMUCC	\$1,426	\$12,000	\$0	\$0	\$120	\$0
49	Kelsey Martin	TAMUCC	\$1,504	\$12,400	\$1,856	\$0	\$8,592	\$0
50	Molly McBride	TAMUCC	\$1,504	\$9,600	\$604	\$0	\$55	\$0
51	Alyssa Outhwaite	TAMUCC	\$1,504	\$12,000	\$0	\$0	955	\$0
52	Ryan Rubino	TAMUCC	\$1,504	\$9,600	\$887	\$0	\$5,522	\$0
53	Lily Walker	TAMUCC	\$1,504	\$12,000	\$573	\$0	\$1,470	\$0
54	Julian Venable	JSU		\$2,250	\$0	\$0	\$1,121	\$0
55	Kennedy Jones	JSU	\$72,000	\$3,498	\$75	\$0	\$0	\$0
56	Miracle Vance	JSU	\$7,200	\$4,081	\$0	\$0	\$0	\$0
57	Andria Miller	JSU	\$695	\$3,498	\$1,544	\$1	\$0	\$0
58	Jeanna Middleton-Dampier	JSU	\$0	\$2,250	\$0	\$0	\$0	\$0
59	Jamie Byrne	CSUMB	\$3,500	\$3,500	\$526	\$0	\$0	\$0
60	Taylor Eddy	CSUMB	\$3,588	\$8,330	\$854	\$0	\$1,361	\$0

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**Direct Student Support disbursed during the reporting period**

	<b>Student Name</b>	<b>NOAA CCME Partner Institution</b>	<b>Tuition</b>	<b>Stipend</b>	<b>Travel</b>	<b>NERTO</b>	<b>One-time research</b>	<b>Professional Development</b>
61	Sarah Kilbane	CSUMB	\$3,500	\$3,500	\$526	\$0	\$0	\$0
62	Malia Machado	CSUMB	\$3,500	\$3,500	\$526	\$0	\$0	\$0
63	Lauren Parker	CSUMB	\$7,176	\$18,326	\$0	\$0	\$104	\$0
64	Miya Pavlock-McAuliffe	CSUMB	\$3,788	\$8,330	\$0	\$0	\$56	\$0
65	Caroline Rodriguez	CSUMB	\$7,176	\$18,326	\$557	\$5,000	\$3,236	\$0
66	Alexandra Thomsen	CSUMB	\$7,176	\$18,326	\$557	\$5,000	\$4,349	\$0
67	Natalie Vaughn	CSUMB	\$4,500	\$4,500	\$526	\$0	\$140	\$0
68	Riley Young	CSUMB	\$2,000	\$2,000	\$1,296	\$0	\$90	\$0
	<b>Totals</b>		\$382,412	\$447,337	\$18,139	\$10,068	\$45,251	\$49
	<b>Grand Total</b>		<b>\$903,256</b>					

\*Note fringe not included in final calculation of Direct Student Support. Seven additional students (Cohort 5) joined the program during the reporting period and will receive funding support for the Fall, which will be reported during the next reporting period. Student Miranda White completed her B.S. and transitioned to an M.Sc. during this reporting period.

**Post-Doctoral Program -**

During this reporting period, NOAA CCME Postdoctoral Research Associate Dr. Emily Jones completed her internship with her NOAA mentor, Jennifer Doerr (SEFSC Galveston) and her postdoctoral position with NOAA CCME.

Former 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 Professor at UTRGV.

**NERTO and Student Internships with NOAA**

Twenty-eight 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**

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

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

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**

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 95 (seeking 103 degrees) and graduate 36 (37 degrees) in NOAA-mission sciences.
2. **Total number of EPP-funded post-secondary students** who are trained 110 (118 degrees) and graduate 41 (42 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 1 (NOAA Coastal Management Fellow), NOAA contractors 1, NOAA partners 1 (Elkhorn Slough NERR), resource management agencies 6, NGO community

4, academia 3 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: \$\$888,500.

**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), 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 Spring 2019 and is next planned for Spring 2021 in Monterey, CA. The impact on candidate development is tracked and measured through CWCC pre- and post-tests and the Individual Student Development Plan. Individual Student Development Plans were assessed with NOAA CCME Scholars at the end of the Spring 2020 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.*
- *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.*

During this six-month reporting period, NOAA CCME graduated a total of 13 students (9 B.S. and 4 M.S.) in NOAA mission-related disciplines. Over the four years NOAA CCME has been in existence, the center has graduated students with 42 degrees.

All NOAA CCME students participate in a variety of professional development opportunities tracked through the Individual Student Development Plan. To date, NOAA CCME has had 28 graduate scholars participate in a NERTO. At a minimum, students participating in a NERTO prepare a report and present results to staff of the host facility. Many of these scholars also present their NERTO results in center and CSC-wide webinars, national meetings, and in publications.

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

*Outputs:*

- *Number of seminars, new courses, new programs, and new degrees offered to develop working skills and functional competencies to support the NOAA mission and workforce*
- *Total numbers of students supported by the CSCs and degrees awarded that reflect the changing demographics of the nation*

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:

- OneNOAA 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).



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To date, NOAA CCME has supported 110 students pursuing 118 degrees. 86% of these students are from URM communities. To date, NOAA CCME has graduated 41 students with 42 degrees – 13 Master’s and 29 Bachelor’s - with 37 (88%) of these degrees being awarded to students from URM communities

***Outcome 4. Reduce the attainment gap for URM 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 28 URM NOAA CCME Scholars have participated in NERTOs (one during this reporting period). Currently, 13 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:

1. Brianna Alanis (graduated with B.S. and M.S. degrees)
2. Anthony Lima
3. Sandra Leal
4. Nigel Lascelles
5. David Lecusay
6. Liyah Smith
7. Summer Martinez
8. Miranda White

**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 14 works published including: 2 student papers in peer-reviewed journals, 3 faculty (including postdoc) papers published, 1 book edited by a faculty member in which 2 book chapters were published by NOAA CCME authors (one with a student author), 2 peer-reviewed student conference papers published in proceedings volumes, and 4 student theses. Three additional papers with student authors were submitted to peer-reviewed journals. NOAA CCME also had 2 oral presentations at seminars this reporting period – one by a postdoctoral scholar and one by a student. One dataset was developed as part of a NERTO for use at the NOAA host office.

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.*

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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.*

One dataset/tool was developed by NOAA CCME scholar David Lecusay as part of his NERTO for use at the NOAA host office.

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

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

*Outputs*

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

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

1. CWCC evaluation through pre and post-test assessment of attendees,
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 continuously reviews 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

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

Goal 3: Improve the scientific basis for coastal resource management by developing tools and research products to characterize, evaluate, and forecast coastal and marine ecosystem responses to natural and human induced stressors; and

Goal 4: Facilitate community education and outreach relating to the function and relevance of coastal ecosystems and the services they provide to society.

## Appendix A: 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 (23). Red entries represent students who left the program without completion prior to this reporting period (8). Purple entries represent students who reached the end of their funding prior to this reporting period but are still involved with NOAA CCME and finishing degree requirements (3). Green colors represent new students (12) or 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

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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)
											High Resolution Land Use Data
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	PBC	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	TBD	Seeking	In Development

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NOAA CCME Scholars											
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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	Dampier, Jenna	D	JSU	4	Y	TBD	Tim Turner	In Development	TBD	Seeking	In Development
19	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
20	Davis, Beth	M	CSUMB	4		TBD	Alison Haupt	In Development	TBD	Seeking	In Development
21	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
22	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
23	Destefano, Antoinette	M	BCU	3	Y		Raphael Isokephi	In Development		Seeking	In Development
24	Duke, Shalalia	B	BCU	3	Y	PBC	Sarah Krejci	-	-	-	-

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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)
25	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, NOAA National MPA Center	Meta-analysis of West Coast MPA Performance
26	Etienne (Stanley), Ra'Teema	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 Laboratory Office of Science and Technology Integration NWS	Rip Current Model Validation
27	Figueroa, Gabrielle	T	FAMU	2	Y	CI	Michael Martinez-Colon	-	-	-	-
28	Flores, Daniel	B	UTRGV	2	Y	PBC	Alejandro Fierro Cabo	-	-	-	-
29	Flores, Elena	M	UTRGV	4	Y	PBC	Alejandro Fierro-Cabo	Effects of Nutrient Enrichment on Mangrove and Saltmarsh Habitats	Spring 2021	Jennifer Doerr, NMFS/SEFSC Galveston	Assessing nutrient levels in black mangrove habitats and potential effects on the distribution and composition of estuarine nekton species assemblages in a changing salt marsh-black mangrove landscape
30	Garcia, Javier	B	UTRGV	2	Y		John Breier	Using computer vision techniques for event classification and data compression during autonomous oceanographic missions.	-	-	-
31	Garrett-Mills, Amonra	T	FAMU	4	Y						



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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)
32	Gonzalez, Edith	B	UTRGV	4	Y	PBC	Carlos Cintra				
33	Grant, Jada	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
34	Gullatte, Kennedy	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
35	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
36	Hamilton, Alexis	B	FAMU	1	Y	CI	Richard Long	-	-	-	-
37	Harris, Elizabeth	M	TAMUCC	3		CI	Paul Montagna	Multiple Stressors: Interaction between freshwater inflow and contaminants on toxicity of estuarine organisms	Summer 2021	Dr. Marie DeLorenzo, NCCOS	Ecotoxicology Assessment of Climate and Pesticide Interactions in Estuarine Systems for CCME Student
38	Hernandez, Rebekah	M	UTRGV	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

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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)
39	Holmes, Walter	B	FAMU	1	Y		Charles Jagoe	-	-	-	-
40	Johnson, Benjamin	B	FAMU	1	Y		-	-	-	-	-
41	Jones, Kennedy	B	JSU	2	Y	CI	Ranjani Kulawardhana	-	-	-	-
42	Kilbane, Sarah	B	CSUMB	4			Corey Garza				
43	Kirby, Ayanna	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
44	Lacey, Ashley	D	FAMU	3	Y	TBD	Phyllis Gray-Ray/Charles Jagoe	In Development		Seeking	In Development
45	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
46	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	-
47	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	Completed Spring 2020	-; Dr. Chris Kelble, NOAA OAR AOML	-; A multi-metric index for south Florida coastal ecosystems

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48	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
49	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; -
50	Lopez, Jaime	B	UTRGV	1	Y		Owen Temby	-	-	-	-
51	Lyons, Willis	D	FAMU	2	Y		Michael Abazinge	In Development	Anticipated Summer 2021	Pending	To be developed
52	Machado, Malia	B	CSUMB	4	Y	CI	Nathaniel Jue	-	-	-	-
53	Machucah, Connie	M	CSUMB	4	Y		Nathaniel Jue	In Development		Seeking	To Be Developed
54	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
55	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

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											Varying Densities of Artificial Reefs
56	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)
57	Martinez, Summer	T;M	FAMU	3;4	Y	CI/CR	Richard Long	To be developed-	-	Seeking	To be developed
58	Matuch, Cindy	B	CSUMB	4	Y		Jue				
59	Mauney, Nina	M	CSUMB	4	Y		Garza	In Development		Seeking	In Development
60	McBride, Molly	M	TAMUCC	4		CI	Mike Wetz	In Development		Seeking	In Development
61	McKinnon, Tayler	B	FAMU	1	Y			-	-	-	-
62	McKinzie, Robert	B	BCU	3	Y	CI	Hyun Cho	-	-	-	-
63	Medley, Daryin	M	FAMU	3	Y	CI	Steven Morey	Fin Whale Trends in the Bering Sea and Unimak Pass	April 2021	Dr. Carol Ladd, OAR/PMEL; Dr. Catherine Berchok, NMFS/AFSC	Analysis of Fin Whale Occurrences in the Southeastern Bering Sea
64	Melendy, Shawn	M	CSUMB	4	Y		Olson	In Development		Seeking	In Development

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65	Meredith, Melissa	B	CSUMB	1		CI	Cheryl Logan	-	-	-	-
66	Miles, Jordan	B	FAMU	4	Y						
67	Miller, Andria	B	JSU	4	Y		Brent Thoma	-	-	-	-
68	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
69	Molina, Mario	B	UTRGV	4	Y	PBC	David Hicks	-	-	-	-
70	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
71	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
72	Navarro, Javier	M	UTRGV	2	Y	PBC	Alejandro Fierro Cabo	Analysis of the facilitative relationship between Batis maritima and Avicennia germinans seedlings as mangrove restoration strategy	COMPLETED: Summer 2019	Jennifer Doerr, SEFSC	The distribution and composition of estuarine nekton species assemblages in a changing salt marsh-black mangrove landscape for NOAA EPP Graduate Student
73	Outhwaite, Alyssa	D	TAMUCC	4		PBC	Jennifer Pollack	To be developed-	-	Seeking	To be developed
74	Parker, Lauren	M	CSUMB	1		PBC	James Lindholm	The ecology of organisms on the "lost reefs" of the	COMPLETED: Fall 2018	Dr. Andrew Devogelaere,	Meso-photic reefs of the Monterey Bay

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								MBNMS: diver-held video surveys from 20-40 m water depth.		Research Coordinator, Monterey Bay NMS	National Marine Sanctuary
75	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
76	Perriman, Geramy	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
77	Preyer, Devon	B	CSUMB	3	Y	CI	Steve Moore	-	-	-	-
78	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
79	Ray, Carlos	B	FAMU	3	Y	CI	Michael Abazinge	-	-	-	-
80	Rigo, Joshua	M	FAMU	3	Y	CI	Hongmei Chi	To be developed	Sep-Dec 2020	Mike Churma, NWS/MDL	Rip Current Image Analysis and Model Validation
81	Roberts, Jordan	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
82	Rodriguez, Asael	M	UTRGV	4	Y	PBC	Fierro-Cabo	To be developed		Seeking	In Development

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83	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
84	Rodriguez, Cassandra	B	UTRGV	1	Y		David Hicks	-	-	-	-
85	Rolle, Shaquila	B	FAMU	1	Y	CI	Richard Long	-	-	-	-
86	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
87	Rubino, Ryan	M	TAMUCC	3	Y	PBC	Joe Fox	To be developed-	Summer 2021	Seeking	To be developed
88	Salinas, Victoria	M	UTRGV	3	Y	PBC	David Hicks	Growth and Reproduction studies of Black Corals (antipatharians): South Texas	Anticipated Spring 2021	Dr. Cheryl Woodley, NOS	Developing propagation techniques for the black wire coral, <i>Stichopathes lutkeni</i>
89	Sanchez, Katia	B	UTRGV	3	Y		Owen Temby	-	-	-	-
90	Seida, Maggie	B	CSUMB	4			Moore				
91	Shokere, Alexis	B	FAMU	1	Y		Michael Abazinge	-	-	-	-
92	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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93	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
94	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
95	Turner, Damarcus	M	FAMU	4	Y	TBD	Martinez-Colon	In Development		Seeding	In Development
96	Uribe, Natalie	B	UTRGV	4	Y	PBC	Cintra				
97	Uwaibi, Ariana	D	FAMU	2	Y	CI	Richard Long	In development	Summer 2020	Dr. Reagan Errera, OAR/GLERL	To be developed
98	Vallejo, Juliet	M	UTRGV	4	Y	CR	Owen Temby	Scientific Knowledge Management in the Gulf of Mexico		Seeking	-
99	Vance, Miracle	B	JSU	3	Y			-	-	-	-
100	Vaughn, Natalie	B	CSUMB	3	Y	PBC	John Olson	-	-	-	-
101	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
102	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	Re-immersion time for reduction of <i>Vibrio parahaemolyticus</i> and <i>Vibrio vulnificus</i> to



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										Estuarine Eutrophication Assessment, NCCOS, Cooperative Oxford Laboratory	ambient concentrations in Eastern Oysters
103	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,4Cooperative Oxford Laboratory	Eutrophication, shellfish aquaculture, and bioextraction: ecosystem services provided by oysters
104	Watkins, Gabrielle	B	BCU	3	Y	CI	Juan Calderon	-	-	-	-
105	Watson, Harrison	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
106	Watson, KiAnna	B	BCU	4	Y						
107	Webb, Jessica	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
108	White, Miranda	B,M	BCU	4;4	Y	PBC	J. Cho	To be developed		Seeking	-
109	Windham, Shelby	B	JSU	1	Y	PBC	Brent Thoma	-	-	-	-
110	Young, Riley	B	CSUMB	3		PBC	Corey Garza	-	-	-	-

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

<b>Institution</b>	<b>Degree</b>	<b>Proposed</b>	<b>Accomplished</b>	<b>Proposed</b>	<b>Accomplished</b>	<b>Proposed</b>	<b>Accomplished*</b>		
<b>FAMU</b>									
	<b>Cohort 1 and 2</b>			<b>Cohort 3</b>		<b>Cohort 4</b>	<b>(In Progress)</b>		
	Bachelor's	11	11	Bachelor's	5	5	Bachelor's 0 2		
	Master's	4	4	Master's	0	4	Master's 4 2		
	PhD	6	4	PhD	0	1	PhD 0 0		
<b>B-CU</b>									
	<b>Cohort 1 and 2</b>			<b>Cohort 3</b>		<b>Cohort 4</b>			
	Bachelor's	0	0	Bachelor's	0	3	Bachelor's 0 1		
	Master's	4	5	Master's	0	1	Master's 4 2		
	PhD	0	0	PhD	0	0	PhD 0 0		
<b>CSUMB</b>									
	<b>Cohort 1 and 2</b>			<b>Cohort 3</b>		<b>Cohort 4</b>			
	Bachelor's	3	3	Bachelor's	0	3	Bachelor's 3 5		
	Master's	2	3	Master's	3	2	Master's 0 3		
	PhD	0	0	PhD	0	0	PhD 0 0		
<b>JSU</b>									
	<b>Cohort 1 and 2</b>			<b>Cohort 3</b>		<b>Cohort 4</b>			
	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 1		
<b>TAMUCC</b>									
	<b>Cohort 1 and 2</b>			<b>Cohort 3</b>		<b>Cohort 4</b>			
	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		
<b>UTRGV</b>									
	<b>Cohort 1 and 2</b>			<b>Cohort 3</b>		<b>Cohort 4</b>			
	Bachelor's	5	7	Bachelor's	0	2	Bachelor's 0 3		
	Master's	6	6	Master's	0	2	Master's 6 4		
	PhD	0	0	PhD	0	0	PhD 0 0		
<b>Center Total</b>									
	<b>Cohort 1 and 2</b>			<b>Cohort 3</b>		<b>Cohort 4</b>			
	<b>Bachelor's</b>	<b>24</b>	<b>29</b>	<b>Bachelor's</b>	<b>7</b>	<b>15</b>	<b>Bachelor's</b>	<b>6</b>	<b>11</b>
	<b>Master's</b>	<b>21</b>	<b>20</b>	<b>Master's</b>	<b>3</b>	<b>12</b>	<b>Master's</b>	<b>19</b>	<b>13</b>
	<b>PhD</b>	<b>12</b>	<b>11</b>	<b>PhD</b>	<b>0</b>	<b>3</b>	<b>PhD</b>	<b>0</b>	<b>2</b>
<b>TOTAL</b>		<b>57</b>	<b>60</b>		<b>10</b>	<b>30</b>		<b>25</b>	<b>26</b>
<b>Total Degrees Proposed</b>		<b>116</b>	<i>Total degrees proposed excludes Postdoctoral research associates (2)</i>						
<b>Total Degrees Supported</b>		<b>104</b>	<i>Total degrees supported excludes Postdoctoral research associates (2)</i>						
<b>* Differences between proposed and accomplished goals are explained in Section VI.</b>									

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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**

B1. Science Advisory Council Members

B2. 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. James 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

\*Outgoing Members

\*\*New Members

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.

Jenn Eckerle, Deputy Director, Ocean Protection Council

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

\*\*Dr. Robert Richmond, University of Hawaii at Manoa

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Dr. Bob Richmond is a Research Professor and Director of the Kewalo Marine Laboratory, University of Hawaii at Manoa. His major areas of interest and expertise include coral reef biology, ecotoxicology, marine conservation biology, bridging science to management and policy, and the integration of traditional ecological knowledge with modern approaches to natural resource use and protection. He has worked in the Pacific Islands for 40 years and has mentored over 70 Native Hawaiian and Pacific Islanders in pursuing undergraduate and graduate degrees in STEM disciplines. He has been the P.I. on four NSF Advanced Technological Education grants that serve the Pacific regional community colleges in American Samoa, the Marshall Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands and Palau, supporting efforts to increase the engagement of underrepresented minorities in STEM.

\*\*Dr. Curt Storlazzi, Research Geologist, USGS Pacific Coastal and Marine Science Center

Dr. Curt Storlazzi is a Project Chief Scientist with the U.S. Geological Survey's Coastal and Marine Hazards and Resources Program and Research Associate with the University of California at Santa Cruz's Institute for Marine Science. He presently leads a USGS team examining the geologic and oceanographic processes that affect the health and sustainability of coral reefs, and the hazard risk reduction they provide adjacent coastlines. He is on the steering committee for the US Coral Reef Task Force and regularly contributes scientific review for the US Global Change Research Program, the US Department of the Interior, the US Department of the State, the US Department of the Defense, and the US's and other countries' National Science Foundations.

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

\*Lisa Gonzalez, President and Chief Executive Officer, Houston Advanced Research Center

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 (NH<sub>3</sub>), 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. Francisco Werner, Director of Scientific Programs and Chief Science Advisor, NOAA Fisheries

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Larry Robinson, Principal Investigator and Center Director

Dr. Francisco (Cisco) Werner is the Director of Scientific Programs and Chief Science Advisor for NOAA Fisheries, a role he took on in June 2017. In this capacity, he leads NOAA Fisheries' efforts to provide the science needed to support sustainable fisheries and ecosystems and to continue our nation's progress in ending overfishing, rebuilding fish populations, saving critical species, and preserving vital habitats.

## **Appendix B2: Community Stakeholder Advisory Board Members**

**Chair:** Dr. Charles Jacoby  
Supervising Environmental Scientist  
Water Resources  
St. Johns River Management District

Dr. Charles Jacoby is the Supervising Environmental Scientist for the Estuaries Section at the St. Johns River Water Management District and a Courtesy Associate Professor in the Soil and Water Sciences Department at the University of Florida. In these roles, he translates science into sustainable management of aquatic systems. He received bachelor's and master's degrees in biological sciences from Illinois State University, a doctorate in biological sciences from Stanford University, and a master's in business administration from the University of Western Australia.

During his career, he has investigated water quality, seagrasses, spring-fed systems, saltmarshes, mid-water systems, invertebrates, fish, and manatees. Drawing from his experience, he has provided advice to industry and federal, state and local governments in both the United States and Australia, including being a Gubernatorial appointment to Florida's Harmful Algal Bloom Task Force.

### Board Members

\*Outgoing Members

\*\*New Members

\*\*Dr. Jude Apple, Director, Padilla Bay National Estuarine Research Reserve

Dr. Jude Apple is an oceanographer, estuarine ecologist, STEM educator, and Director of the Padilla Bay National Estuarine Research Reserve. His research interests include ocean acidification, plankton communities, eelgrass ecology, and response of coastal ecosystems to a changing climate – and how to use this information to achieve sustainable management of our valuable coastal resources. He is also involved in developing curriculum and professional learning opportunities that advance climate and data literacy for K-12 learners.

Jenna Harper, Director, Apalachicola National Estuarine Research Reserve

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Ms. Jenna Harper has served as the Director of the Apalachicola National Estuarine Research Reserve since 2014. Before moving into the Director role, Jenna served as the Research Coordinator for the Reserve, facilitating in-house research, collaboration with outside researchers and the running the System-wide Monitoring Program. As the Director, Jenna partners with many institutions to address locally relevant coastal management issues such as declining water quality and quantity, changing fisheries status, and climate change impacts. The Apalachicola NERR has been a partner with FAMU in the CCME, and previous to that the Environmental Cooperative Science Center, for 19 years. The NERR is committed to facilitating priority research with CCME scientists and supporting the development of the next generation workforce.

**\*\*Keith Laakkonen, Director, Rookery Bay National Estuarine Research Reserve**

Keith Laakkonen is the Director of the Rookery Bay National Estuarine Research Reserve in Naples, Florida. He is responsible for administration and supervision of the 110,000-acre Reserve and more than thirty employees involved in research, education and coastal stewardship. Priority efforts at the Reserve include watershed restoration, maintaining native biodiversity, research and monitoring. In addition, Keith serves as the state's regional administrator for aquatic preserves in Southwest Florida with oversight of field offices in Tampa Bay, Charlotte Harbor and Estero Bay. Currently, Keith serves as Vice President for the National Estuarine Research Association (NERRA). Keith has earned a M.S. from Florida Gulf Coast University with a focus on environmental policy.

**\*\*Dr. Steven Lonhart, Research Coordinator, Monterey Bay National Marine Sanctuary**

Dr. DeVogelaere oversees the Sanctuary's Research Program. This includes facilitating collaboration among over 20 research institutions in the region, providing technical information to decision makers and the Sanctuary staff, and initiating research on resource management issues. Dr. DeVogelaere is also leading the effort to develop the Sanctuary Integrated Monitoring Network (SIMoN), a critical program that assesses how populations of marine organisms and habitats are changing through time. He has been directly involved in a wide variety of research projects, ranging in habitats from the deep sea to estuaries. His past work experience includes being an elected official as Commissioner for the Moss Landing Harbor District and Research Coordinator for the Elkhorn Slough National Estuarine Research Reserve. He earned a Bachelor of Arts in Biology from the University of California, Berkeley, a Master of Science in Marine Science from Moss Landing Marine Laboratories, and a Doctorate in Biology from the University of California, Santa Cruz.

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

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

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



## **Appendix C: Evaluation Summary**

The External Evaluator continued to work with the CCME Management Team to advance efforts in alignment with CCME Evaluation Plan. The Evaluator had several meetings with the Center Director, Associate Director, and Assistant Director to review ongoing performance in order to ensure that the center is on track to achieving its goals. The Evaluator held meetings to review the results of the three perception surveys that were administered at the end of Project Year 3. Additionally, the Evaluator worked with the Assistant Director, Distinguished Research Scientist, Education Expert, and Data and Communication Specialist to review and revise the annual data reporting template, as well as to validate the Year 4 performance data. The Evaluator participated in a focused call with the Education Expert and Focal Area Leads to discuss ongoing recommendations regarding student feedback. The Evaluator worked both in whole and small groups to help the CCME team prepare for the 4th Year External Review. Finally, the Evaluator held multiple evaluation update meetings with the Center Director in keeping with the approved evaluation plan.

The COVID 19 Pandemic has had significant impact on the External Evaluator's mode of engagement with Center Management Team and other stakeholders. Meetings that were traditionally conducted in-person had to be held remotely. The center and partner institution responses to the pandemic, including the closure of FAMU and partner institutions made it impossible to conduct the previously scheduled site visits. The External Evaluator and Center Management Team are working to plan and schedule virtual site visits in the coming weeks.

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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.

NOAA Funding Year	Tuition	Stipend	Post-Secondary Student Travel	One-Time Allocation Grad. Research	One-Time Support NERTO	Professional Development	Total
1	\$424,759.82	\$702,612.12	\$76,954.97	\$27,380.20	\$28,908.18	\$0.00	\$1,260,615.29
2	\$335,449.84	\$595,778.19	\$88,427.00	\$28,534.52	\$69,445.65	\$2,376.00	\$1,120,011.20
3	\$296,708.53	\$579,020.90	\$45,106.43	\$57,429.21	\$60,186.15	\$3,725.00	\$1,042,176.22
4	\$239,666.14	\$445,501.15	\$19,173.80	\$54,635.12	\$19,437.67	\$445.49	\$778,859.37
Total	\$1,296,584.33	\$2,322,912.36	\$229,662.20	\$167,979.05	\$177,977.65	\$6,546.49	\$4,201,662.08

### 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:*

- NSF GEOPATHS Program, \$389,000. PI Dr. Corey Garza (NOAA CCME CSUMB). “Collaborative Geo-Bridge”. Provides support for a bridge program for recent undergraduate students who lack a research experience but wish to pursue a career or graduate school in geosciences.
- NSF, \$99,500. PI Dr. Corey Garza (NOAA CCME CSUMB) “The SACNAS Geo-Futures Program”. Provides support for students to participate in the SACNAS Geo-Futures program.
- Texas Water Development Board, \$150,000. PI Dr. Paul Montagna (NOAA CCME TAMUCC). “Long-Term Benthic Data Adaptive Management of Three Basins.” Supports NOAA CCME scholars E. Harris and P. Cockett research on freshwater inflow effects.

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- NSF, \$200,000. Co-PI Dr. Sarah Krejci (NOAA CCME B-CU). “NSF RAPID: Educational Interventions for Undergraduate Students and Informal Learners for Robust Learning of COVID-19 Knowledge.” Students will participate in interventions to improve their abilities to create and interpret visualizations and assess quality of information on Covid-19.
- NOAA Planet Stewards. \$50,000. PIs: Drs. Larry Robinson, Sharmini Pitter, Michael Abazinge, Bernadette Kelley (NOAA CCME FAMU), with collaborators J. Cho (NOAA CCME B-CU), D. Hicks (NOAA CCME UTRGV), and C. Garza (NOAA CCME CSUMB). “Ecological significance of living shorelines in selected coastal communities.” This project will fund summer experiences for undergraduate students at four NOAA CCME institutions to conduct investigations of impacts of living shoreline green infrastructure in collaboration with stakeholders at four study sites: Apalachicola Bay, FL, Elkhorn Slough, CA, Halifax River Lagoon, FL, and Laguna Madre, TX.

**Total leveraged funding for reporting period: \$888,500**