NOAA CENTER FOR COASTAL AND MARINE ECOSYSTEMS (CCME)

Semi-Annual Performance Report for
Award Number NA16SEC4810009
Reporting Period: March 1, 2018 – August 31, 2018

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NOAA CCME Semi Annual Performance Report
(March 1 - August 31, 2018)
Larry Robinson, Principal Investigator and Center Director

NOAA Cooperative Science Center Project Performance Report

I. Executive Summary

This report covers the accomplishments for the reporting period March 1 - August 31, 2018 for the National Oceanic and Atmospheric Administration's Center for Coastal and Marine Ecosystems (NOAA CCME). During this reporting period NOAA CCME directly supported a total of 69 students, 88% from underrepresented minority communities, across three cohorts.

Snapshot of 2017-2018 CCME Accomplishments

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

- CCME has graduated our first five students (1 Transfer, 3 B.S. and 1 M.S.), including a B.S. graduate who has rejoined the program as a Master's student, and a M.S. graduate who has entered the STEM workforce at the National Geospatial-Intelligence Agency.
- CCME currently has a total of 62 active graduate and undergraduate scholars (4 community college transfers, 23 first time in college undergraduates, 24 Master's students, and 11 PhD students).
- One CCME Scholar successfully competed to participate in R/V Okeanos Explorer training opportunities (July 2018).
- One CCME Scholar was awarded a slot on the Gulf of Maine Harmful Algal Bloom Cyst Cruise (August 2018).
- Five CCME Graduate Scholar NERTOs have been completed with NOAA researchers at NMFS, OCM, and a National Marine Sanctuary (Summer 2018).
- One CCME Graduate Scholar has completed the National Water Center Innovators Program Summer Institute 2018 in preparation of her NERTO to take place in the Summer of 2019.
- One CCME Graduate Scholar has completed training with NOAA researchers at NWS.
- Eight CCME Scholars attended CHOW with support provided by NOS and OAR from June 5-7, 2018.

Table 1: Number of Funded Students - August 2018

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Institution	Transfer	Undergraduate	Master's	Doctoral	TOTALS
Cohort 1					
FAMU	0	7	3	0	10
B-CU	-	-	3	-	3
CSUMB	-	3	3	-	6
JSU	1	5	1	1	8
TAMU-CC	-	-	1	4	5
UTRGV	-	2	4	-	6
Cohort 2					
FAMU	2	-	1	4	7
B-CU	-	-	1	-	1
CSUMB	-	-	-	-	0
JSU	1	-	-	-	1
TAMU-CC	-	-	-	2	2
UTRGV	-	0	2	-	2
Cohort 3					
FAMU	0	-	1	0	1
B-CU	-	-	-	-	0
CSUMB	-	3	3	-	6

JSU	0	1	0	-	1
TAMU-CC	-	-	0	-	0
UTRGV	-	2	1	-	3
TOTAL Active	4	23	24	11	**62**
Graduated	1	3	1	-	5

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

- CCME Research focuses on the areas of Coastal Resilience, Coastal Intelligence and Place-Based Conservation. Examples of completed NERTOs in these three focal areas include:
    - Coastal Resilience – NERTO Completed: CCME Scholar Cristina Madrid, *Resilient Communities: Local Disaster Coordination in the Rio Grande Valley*

NERTO mentor: Kim Penn, OCM and Dr. Melissa Kenney, University of Maryland ESSIC/NOAA CICS

    - Coastal Intelligence – NERTO Completed: CCME Scholar Nigel Lascelles, *Chemical Characterization of Microplastics Polymers for CSC Graduate Student*

NERTO mentor: Dr. Ashok Deshpande, Sandy Hook, NMFS/Northeast Fisheries Science Center

    - Place-Based Conservation – NERTO Completed: CCME Scholar Anthony Lima, *Inter-agency Cooperation, Policy, and Management of the Gulf of Mexico Fishery*

NERTO mentor: Dr. Scott Large, NMFS/ Northeast Fisheries Science Center

CCME Objective 3. CSC Administration

- NOAA CCME Center Director Dr. Larry Robinson appointed to Federal STEM Education Advisory Panel formed by the National Science Foundation (NSF), in consultation with the Department of Education, NASA and the National Oceanic and Atmospheric Administration (NOAA) to encourage U.S. scientific and technological innovations in education.
- CCME engaged with NOAA personnel, including NOS Deputy Assistant Administrator Nicole Le Boeuf and the Director of the Southeast Fisheries Science Center (SEFSC) Dr. Clay Porch, at the second Annual Meeting jointly held at the Atlantic Oceanographic and Meteorological Laboratory and SEFSC in Miami, FL.
- CCME held its inaugural Science Advisory Council meeting, August 29, 2018.
- CCME held its second Community Stakeholder Advisory Board committee meeting conference call, August 1, 2018.
- The CCME external evaluator developed an evaluation plan template that will be utilized across all four NOAA Cooperative Science Centers (***Special Award Condition II, VI***).
- CCME also hosted a center-wide student orientation teleconference call on August 29, 2018 for the start of the 2018-2019 academic year in preparation of Year 3 CCME activities.

- NOAA CCME conducted a site visit of CCME Partner Institution UTRGV on July 16, 2018

Looking to Year 3

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

In order to meet the established Year 3 recruitment goals NOAA CCME will recruit 9 Community College Transfer students, 18 Master's students, and 2 PhD students – applications are currently under review.

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

- NOAA CCME Expects the completion of 17 additional NERTOs by the end of Year 3.
- The second CCME CWCC will take place from May 19-24, 2019 in Brownsville and South Padre Island, TX.
- 19 CCME Scholars are expected to graduate within Year 3

CCME Objective 2. Research

- CCME faculty and staff will participate in two CSC Special Sessions titled *Linking Natural and Social Science to Understand Societal Impacts of Research* and *A STEM learning Community of Practice Network* as part of the American Meteorological Society (AMS) Meeting to be held in January of 2019.
- CCME faculty and staff will submit a plan for a CSC Special Session titled *Education Partnerships in Coastal and Marine Science* as part of the Coastal and Estuarine Research Federation (CERF) Conference to be held in November of 2019.
- 16 CCME Graduate Scholars are expected to complete their NERTO requirements by the end of Year 3.

CCME Objective 3. CSC Administration

- NOAA CCME Plans to hold its third annual meeting at the Southwest Fisheries Science Center in La Jolla, CA from April 10-12, 2019.
- NOAA CCME began design of CWCC to occur at San Padre Island, TX May 19-24, 2019.

Key Personnel

- The NOAA CCME Distinguished Research Scientist has now joined the team. Dr. Steven Morey joins us from Florida State University where he served as the Senior Research Scientist for the Center for Ocean – Atmospheric Prediction Studies.
- The second NOAA CCME Postdoctoral Research Assistant, Dr. Emily Jones, has also been hired (*Special Award Condition V)*.
- The duties of the Data, Communication, and Information Manager are currently being fulfilled by the Center Management Team. NOAA CCME is advertising the Data, Information, and Communication Manager position through the State University System of Florida and utilizing contacts among the NOAA CCME Co-Principal Investigators and various professional societies, particularly those that include computer science related professionals.

I. Accomplishments

NOAA CCME Semi Annual Performance Report
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Major Activities:

NOAA CCME Center Director Selected to Serve on National STEM Advisory Panel
http://ccme.famu.edu/news-events

Engagement with NOAA

9th Biennial NOAA EPP Education and Science Forum March 18-21, 2018
Hosted by NCAS-M, Howard University, Washington, D.C.
A total of 20 NOAA CCME Faculty and 39 students (both ECSC/CCME supported and non-CSC supported students from NOAA CCME partner institutions) attended the NOAA EPP Education and Science Forum with 22 poster, 8 CCME faculty and postdoctoral presentations and panel discussions, and 7 CCME student oral presentations.

NOAA CCME Annual Meeting April 12-13, 2018
The second NOAA CCME Annual Meeting was hosted at the Atlantic Oceanographic and Meteorological Laboratory (AOML) and the Southeast Fisheries Science Center (SEFSC). NOAA CCME met with AOML/PHOD Deputy Director Dr. Molly Baringer, SEFSC Deputy Director Dr. Theo Brainerd and SEFSC Director Dr. Clay Porch. Subsequent communication between NOAA CCME and several NOAA attendees of this meeting appears likely to result in several NERTOs for NOAA CCME Scholars along with other opportunities for future engagement.

Specific Objectives:

1. Recruit, train, and graduate students, particularly from underrepresented minority groups, with the competencies and skills that support NOAA's Education Strategic Plan, workforce goals and strategic objectives.

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

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

Tallahassee Community College March 7, 2018
NOAA CCME Assistant Director Dr. Sharmini Pitter and NOAA CCME Faculty Dr. Richard Long coordinated an effort with the Florida A&M University Transfer Coordinator to meet with the TCC STEM Center Director and students to recruit transfer students to the NOAA CCME. One student was successfully recruited.

Valencia College Visit to CCME FAMU January 26, 2018
(*not previously reported)

NOAA CCME Assistant Director Dr. Sharmini Pitter and NOAA CCME Faculty Dr. Richard Long hosted a group of 6 students from Valencia College to tour the Florida A&M University Campus and learn about opportunities provided by NOAA CCME.

1c) *Utilize the Center-Wide Competency Course (CWCC) to ensure student proficiency in CCME focus areas.*
The initial planning and development of the 2019 CWCC curriculum began during the reporting period. The 2019 CWCC will be held in Brownsville and South Padre Island, TX during the next reporting period and will be hosted by NOAA CCME Partner institution University of Texas Rio Grande Valley. Each focal area and cross-cutting team will work to create a curriculum to address the NOAA CCME student competencies.

1d) *Expose students to broader research and experiential learning opportunities such as Student Scholarship Internship Opportunities (SSIO) and NERTO, as well as through partnerships with NOAA and other scientists.*
Established SSIOs and NERTOs are shared with NOAA CCME Scholars. In addition, NERTOs have been created for NOAA CCME students through identified NERTO mentors. During the reporting period five CCME Graduate Scholar NERTOs have been completed with NOAA researchers at NMFS, OCM, and a National Marine Sanctuary (Summer 2018).

2. Conduct research leading to the development of management and communication tools that can be utilized to enhance the resilience of coastal communities and economies.

At the time of reporting several student project proposals have been assessed which will address the development of management and communication tools to enhance the resilience of coastal communities and economies. (See *Current tools in development*)

2a) *Assess coastal risks and vulnerabilities*

2b) *Identify solutions to reduce risks and vulnerability*
2c) *Utilize engagement to empower coastal communities.*

3. Develop competency and skills in the utilization of new and existing "Big Data" archives in decision support tools that promotes the vibrancy of coastal and marine ecosystems.

3a) *Develop and implement a "Big Data Analytics Boot Camp".*
The Big Data Analytics Boot Camp was not scheduled for the current reporting period. During the current period NOAA CCME Faculty shared Big Data resources with students and planned future Big Data activities. The Big Data Bootcamp will include instruction for R programming language and additional big data tools.

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

Coastal Intelligence Projects will utilize large data sets related to coastal and marine ecosystems. Students in this focal area have been encouraged to explore incorporating existing NOAA data sets

and/or contributing to existing public data sets as part of their research projects. Students are also trained to be familiar with NOAA datasets and learn to use R and other computer software to analyze large, complex datasets.

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

Significant Results: See Executive Summary

Student Highlights:

CHOW Experience, CCME Graduate Scholar, Samuel Mwenda
Attending the 2018 Capitol Hill Ocean Week (CHOW) conference representing the Center for Coastal and Marine Ecosystems (CCME) was an honor as well as an enlightening experience. The speakers, panels, and sessions sought to bring to the fore every pertinent topic relating to oceans. Convened by the National Marine Sanctuary Foundation, the theme this year was focused more on how innovative partnerships lead to more effective change. From media to private equity firms, the core principle was initiating conversations that lead to policy results. Held from the 5th to the 7th of June, this year was the first that separate multiple sessions occurred concurrently. This enabled participants to attend focal areas of importance to current or future research as well as make connections to leaders in the field.

Arriving the first day, the conference began with opening remarks from the president of the foundation Kris Sarri. She spoke of how important it is in these times to persuade politicians and pursue policies that replenishes natural resources in oceans. Ms. Sarri also elaborated on how conferences such as CHOW paved the way to helpful legislation by bringing together scientists, policy makers, industry, and the general public. After her remarks, Julie Lawson a representative for the District of Columbia (D.C.) Mayor's office presented Ms. Sarri with a decree stating June 5th Ocean Day. She then proceeded to speak, illuminating how the Mayor's administration was committed to marine issues through various projects conducted around the city.

The first panel was centered on media as it brought together producers and influencers. Common themes that were transferrable across various fields included personalization, accessibility, and comedy. These not only capture the intended audience through intimate connections but then achieve the intended goal by education of the issues. They ended by stating that the best way to move policy forward from its current state was to bridge differing opinions from various stakeholders. The first session attended was adaptive management for shifting populations which were sponsored by the International Fund for Animal Welfare. Most of the conversation centered around wild and fishery population in the Northeast as well as the Mid-Atlantic. Congresswoman Pingree discussed problems her home state of Maine, where the lobster industry is a $1-billion-dollar market. Warming waters resulting from climate change forces marine populations to move further north which impact the economic vitality of coastal communities. Additionally, this burdened neighboring states, who had to adjust to shifting

populations not originally native to those areas. Recommendations included including comprehensive management in all relevant scales from local entities to national bodies.

During lunch the group met and had the opportunity to converse with Dr. Christopher Moses as well as Dr. Steven Thur. The conversation turned to what each scientist did at the National Oceanic and Atmospheric Administration ((NOAA) and how they ended up in their positions. Advice on how to market ourselves and offering realistic expectations about working with the agency, dominated the conversation during lunchtime. Both inquired about the nature of our research and what we wanted to do with it in the future which tied into our career goals. After lunch, Dr. Moses introduced us to a high ranking NOAA administrator, who implored us to study hard and bring our enthusiasm to the agency.

The group attended the keynote address immediately after lunch. The speak was the director of NOAA, retired U.S. rear admiral Dr. Tim Gallaudet. Appointed by the president, the speech covered potential impact of climate change as well as the economic benefits of protecting marine and estuarine areas. Benefits include more food, increased trade, and healthier ecosystems. The majority of the time was spent touting how the administration was a strong partner in shoring up dollars for conservation/protection efforts.

Subsequently, I ambled to the next session that discussed cultural connections and the environment. The session started off defining what culture meant to each of the panelists. The most interesting interpretation to me stated that culture meant empowerment and involved the power of storytelling. The values associated with culture need to be able to adapt in a rapidly changing environment. Recommendations on how to efficiently stitch culture and the environment included working with the youth to shape their ideals. By helping them forge a connection to the environment, the new generation when in power will be informed by their values as they decide policy. It was described as using the most important resource to protect our most endangered resource. Other recommendations included finding new ways to transmit information and harnessing local knowledge to greater effect. Midway through, the panel was interrupted by a member of congress coming to discuss his platform and how that related to culture. The main takeaway was that unlike most policymakers, he made an effort to consider disproportionate effects to underserved communities.

The next day, the session selected was the Gulf Coast Restoration panel. Most of the discussion centered on how to remedy the effects being felt and mitigate the damage currently occurring. Conserving and restoring wetlands damaged by dredging was a big topic. Millions of acres continue to be lost as sediments and silt do not accrue quickly enough. The accretion process had been impacted due to modified hydrological patterns. By extension, the frequently flooding combined with climate change have irrevocably altered the way of life for numerous communities, many indigenous along the coast. Additionally, the probability of stronger storms due to warmer oceans also was broached. The case study was Houston. Katrina was introduced as a catalyst for change and panelists discussed what they took away from that event. The state that everyone focused on was Louisiana.

Following that I attended the Market Based Solutions sessions. I expected more out of the session than I thought I received. The two panelists I gravitated to were the representative from Sea World and the entrepreneur. Those two gave the most cogent answers in my opinion. Ms. Flumerfelt from the Monterey Fisheries Trust had very good insight when it came to public-private partnerships, however the other two gave examples of possible market bases solution from their experience.

During the course of the conference Dr. Moses introduced us to so many NOAA employees and affiliates. We met two former sea grant fellows, one of whom was also a Knauss fellow. There was an opportunity to meet several scientists as well as groups from Florida such as the Scubanauts. The last day was where everything came to fruition. We employed the tactics taught to us to cajole and persuade congressional staffers while also making contacts with fellow environmental groups. Everyone attended Hill Day where we listened to a quick panel from activists on how to capture and retain the attention of congressional staffers. We practiced our two-minute pitches and were then thrust into the unknown. First, we traveled to the office of Senator Marco Rubio where we conversed with his page assigned to environmental issues. It went fairly well. He mentioned specific policies that either Sen. Rubio had crafted or supported that showed his commitment to the environment. Following that meeting we met with a staffer from the office of Senator Feinstein who didn't really give specifics on what legislation that either they sponsored or supported. The best meeting that we had as a group probably came with staffers representing Senator Wicker from Mississippi. They were engaged and passionate about the ocean especially considering the state borders the Gulf of Mexico. We also spoke with staffers representing Senators Ted Cruz & Kamala Harris.

Overall, the event was entertaining, informative, and rewarding. It was heartwarming to meet so many people that were equally as passionate about marine issues as the CCME cohort. Moreover, it was amazing to talk with everyone at the booths that sacrificed their time to come and present. From the Department of the Interior, the National Oceanic and Atmospheric Administration (NOAA), and the Littoral Society, everyone was welcoming and gracious. My hope is that as CCME grows as a program and CSC, that many more students will have the chance to experience our nation's capital as change agents and future scientists.

Key outcomes or other achievements: See Executive Summary

NOAA CCME Areas of Focus

Coastal Resilience Summary

The NOAA CCME Coastal Resilience (CR) consists of nine NOAA CCME faculty members who meet monthly via conference calls to advance the NOAA CCME Coastal Resilience objectives and to discuss student research proposals. CR discussions and activities remained closely linked to the Social Science Committee (SSC) and other focal area committees as members continued to serve on multiple committees, fostering cross-group communication, cross-pollination of approaches, and familiarity with NOAA CCME research. The CR continued to conduct its monthly meetings as a combined call with the Place-based Conservation (PBC) and Social Science Committees. Dr. Temby volunteered to take over leadership of the CR during the period and now serves as Chair again.

CR Table 1: Coastal Resilience focal area committee members

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

During this period, the number of NOAA CCME scholars associated with this focal area increased to four. NOAA CCME student Miya Pavlock McAuliffe presented to the CR on her research proposal synopsis March 26, 2018, gaining focal area approval. One additional student was being recruited to this focal area in fulfillment of a CR recruitment goal, but that student decided in the end to accept an offer outside of the CCME. TAMUCC recruited another student, Mariana León Pérez, in Summer 2018 who will likely join the CR. The group has planned recruiting activities for Year 3 of the award that will involve the entire Center and the other NOAA Cooperative Science Centers.

CR Table 2. Coastal Resilience student proposal synopses presented and approved by CR

CCME Scholar	Degree Level	Synopsis Title	Faculty Advisor(s)
Mallory Brooks	M	Evaluating the effectiveness of restored shorelines in mitigating non-point source pollution and climate impacts in the Mosquito Lagoon, Florida, USA.	Hyun Jung ("J.") Cho
Cristina Madrid	M	Local Disaster Coordination in the Rio Grande Valley	Owen Temby

Samuel Mwenda	M	Assessing Treatment Wetland Efficacy and Public Education in Stormwater Treatment Utilizing Native Wetland Plants	Hyun Jung ("J.") Cho
Miya Pavlock McAuliffe	M	Quantifying Sediment Transport Along a Rocky Embayed Coastline: The Southern Monterey Bay, CA	Rikk Kvitek (CSUMB) and Ivano Aiello (MLML)

NOAA CCME Scholars who attended the 9th Biennial NOAA EPP Education and Science Forum were exposed to essential information in incorporating social science perspectives and analysis into their research. Specifically, NOAA CCME Graduate Scholar Miya Pavlock McAuliffe outlined a couple of options for incorporating human dimensions into her thesis that she learned while attending the 9th Annual NOAA EPP Forum in March. Based on that collaboration, she is exploring the use of crowd-sourced bathymetry data that boat users are collecting and, alternatively, working with the Monterey Bay Aquarium on public communication.

NOAA CCME Coastal Resilience students made excellent progress with planning their NERTO internships, with two of them completing their NERTOs during the reporting period. Specifically, NOAA CCME Graduate Scholar Mallory Brooks has completed a 12-week NERTO at the NOAA's St. Pete Regional Office (May through Aug 2018). Following a meeting with the Caribbean Fishery Management Council, Dr. Bill Arnold and Miguel Rolon offered Mallory Brooks a 3-year position with the Council. She would be completing similar tasks that were started during her internship, including fisheries research, data analysis, and GIS mapping as the Caribbean Branch moves from species-based fisheries management to island based Fisheries Ecosystem Plans. The position is based out of NOAA's St. Pete Regional Office, but travel to the Caribbean would occur as needed and covered by the Council.

NOAA CCME Graduate Scholar Cristina Madrid completed her NERTO at the NOAA Office for Coastal Management in Maryland, which she and Dr. Temby found through an undergraduate SSIO that they were able to convert to a graduate NERTO. Through the project, entitled "Gray, Green, and Cultural Infrastructure Solutions to Enhance Coastal Resilience", Cristina helped implement a stakeholder engagement approach via a week-long workshop on the Eastern Shore of Maryland with a focus on helping communities become more resilient to coastal hazards and climate change impacts, including sea level rise and salt water intrusion. She provided research and coordination support for the workshop, co-authored a comprehensive report, and built out a Sustainable Adaptive Gradients in the Coastal Environment (SAGE) coastal resilience case study on Virginia Beach.

NOAA CCME Graduate Scholar Samuel Mwenda will complete his NERTO at the same location in spring 2019. The internship will involve developing and refining an impoundment inventory for the purposes of prioritizing future salt marsh restoration opportunities along the South Atlantic coast.
NOAA CCME Graduate Scholar Miya Pavlock McAuliffe chose a NERTO project focused around geospatial data collection and visualization to aid in communication between MBNMS and regional partners. This will include collecting geospatial data within MBNMS, enhancing

existing geospatial visualization tools of MBNMS in the coastal environment and offshore, and finally to improve and encourage communication and understanding between academic research and resource management efforts.

CR Table 3. Coastal Resilience Student NERTOs and Status

Student	NERTO Site	Research Interests	NERTO Mentor	Status	NERTO Schedule
Mallory Brooks	NOAA Fisheries Southeast Regional Office	Fisheries research, data analysis, and GIS mapping	Bill Arnold	Completed	Summer 2018
Miya Pavlock McAuliffe	Monterey Bay Sanctuary Office	Coastal Erosion and sediment transport	Andrew DeVogelaere	Project description submitted to CCME, pending approval	Spring 2019
Samuel Mwenda	NOAA Fisheries Southeast Regional Office	Coastal urban planning and resource management	Leslie Craig and Lisa Vandiver	Project description submitted to CCME, pending approval	Spring 2019
Cristina Madrid	NOAA Office for Coastal Management (OCM)	Emergency Management and social networks among preparedness stakeholders	Kim Penn	Completed	Summer 2018

In the prior period, the CR finalized and adopted four coastal resilience core competencies that were based on the objectives established for this focal area in the NOAA CCME award – objectives that themselves are based on NOAA coastal resilience priorities. This ensured alignment of the coastal resilience education and training activities, which will be designed to build student knowledge and understanding of the identified competencies with the award and NOAA priorities.

During this reporting period, the group reviewed two new social science core competencies that were drafted by Dr. Kelley, CCME Education Expert, and Dr. Howse, External Evaluator, for CCME. By design, this distribution of the social science competencies across the focal areas will foster the social science/human dimensions integration that CCME seeks to achieve. With the focal area committees each accepting co-responsibility with the Social Science Committee for two of the six social science competencies, social science integration in education and training will be achieved across the Center. Coastal Resilience members recognized and agreed that coastal resilience and social science are closely related and inextricably linked. The CR group adopted the two social science core competencies and agreed to develop education and training for students that align with the competencies.

Coastal Resilience Core Competencies

CCME students will demonstrate knowledge and understanding of:

1. The natural and nature-based infrastructure that address the impact of extreme weather on coastal ecosystems and communities.

2. The community-based approaches for the preservation, fortification, and enhancement of natural and nature-based coastal infrastructure.
3. The models for community-based approaches for assessing the vulnerabilities and value of proposed solutions relating to the impact of extreme weather and sea-level rise on coastal ecosystems and communities.
4. The tools used to study natural and nature-based infrastructure that mitigate the impact of extreme weather and sea-level rise on coastal communities and ecosystems.
5. Integrating models and practices and other decision-making tools for ecosystem-based management.
6. Advocating for the accountability of social science in planning and budgeting to enhance coastal community projects.

With the core competency framework in hand, the CR commenced planning for the next Center-Wide Core Competency course (CWCC). The NOAA CCME Education Committee requested that online preparatory modules and materials be submitted by December 1, 2018 so students can begin working on them in preparation for the May 2019 CWCC. The CR discussed updating the recorded lectures from the 2017 CWCC, which introduced students to coastal law, ecosystem-based management, and environmental economics. Those modules were excellent but will need to be adapted to the new location and community problem students will explore at the CWCC. Members were asked to update their slides to fit the focus of the 2019 CWCC. Dr. Temby and his colleagues at UTRGV, hosts for the CCME CWCC, are working on overarching themes for the problem-based learning activity (PBLA) and will provide details by the September CR call. Then online materials can be modified to reflect the PBLA.

Members agreed that the 2017 modules addressed social science more than coastal resilience, and Dr. Temby proposed generating additional modules that are new and separate from social science. Additionally, NOAA EPP shared some excellent online resources from the NOAA Social Science Committee and the Office of Applied Research (OAR). CCME TAMUCC's Mikell Smith, who helps coordinate the CR, and Dr. Richard McLaughlin previewed the OAR webinars and Social Science Minicourse to help faculty evaluate them against the core competencies as a means to guide them in identifying the most appropriate materials to include. While the NOAA resources were developed to address social science priorities, CR members felt the modules would also have relevance for coastal resilience. Review and analysis bore out that assumption and served as a gap analysis for CWCC coverage of the core competencies. Smith located additional NOAA resources for faculty to consider if needed for curriculum development. Faculty agreed to review the NOAA resources and provide feedback by the September 2018 CR conference call. That will assist with filling out the competencies coverage and ensure the group remains on schedule to finalize materials.

CR Table 4. NOAA CCME Student Level Competencies Coverage[1]

Coastal Resilience - CCME students will demonstrate knowledge and understanding of:

[1] A more detailed matrix cross walking the competencies with the content presented in the NOAA modules is available with brief descriptions of relevant content from the modules adjacent to the competencies they address.

1. The natural and nature-based infrastructure that address the impact of extreme weather on coastal ecosystems and communities.	Naturally Resilient Communities (self-paced course)
2. The community-based approaches for the preservation, fortification, and enhancement of natural and nature-based coastal infrastructure.	
3. The models for community-based approaches for assessing the vulnerabilities and value of proposed solutions relating to the impact of extreme weather and sea-level rise on coastal ecosystems and communities.	NOAA Social Science Basics (minicourse)*
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.	Digital Coast resources may have modules Tools catalog on NOAA OCS Digital Coast site Training directory on NOAA OCS Digital Coast site
5. Integrating models and practices and other decision-making tools for ecosystem-based management.	NOAA Social Science Basics (minicourse) * Yoskowitz lecture: "Ecological and Human Well-Being: What is the Missing Link? * Temby lecture: "Ecosystem-Based Management Ecosystem-Based Management item options" *
6. Advocating for the accountability of social science in planning and budgeting to enhance coastal community projects.	NOAA Social Science Basics (minicourse) *

* Confirmed for inclusion in 2019 CWCC

Moving forward, the CR will be looking to at ways to synergize the curriculum with the region where the course will be held.

Looking toward the third year of the CCME award, the group discussed goals and strategies at the CCME Annual Meeting, and later refined the language collaboratively via conference calls (see Accomplishments below). In keeping with the student recruitment goal, the group identified two excellent opportunities and commenced planning. One strategy was born out of an expressed a desire to get involved in the Coastal & Estuarine Research Federation (CERF) underserved, underrepresented effort for recruiting purposes. Dr. Garza shared that he is helping organize the CERF diversity program and suggested proposing a session and a booth. The next (CERF) conference will be in Mobile, AL in November 2019. Dr. Yoskowitz chairs the conference, several other CCME faculty are involved in planning, and the conference is well attended by NOAA scientists that CCME seeks to interact with. Session proposals are due September 20, 2018 so, in collaboration with Drs. Yoskowitz and Montagna, Dr. McLaughlin drafted a proposal for a half- to full-day session that would allow CCME students an opportunity to present their work. NOAA EPP provided valuable input to the proposal, which was expanded to include all

CCME social science faculty can review it and determine the merits of each module in terms of meeting the core competencies requirements.

four NOAA Cooperative Science Centers. CCME can also reserve a booth at the conference from which to base student recruitment efforts.

CCME also reserved a booth at the October 2018 Society for Advancement of Chicanos and Native American Students (SACNAS) in collaboration with NOAA and other NOAA mission aligned groups that will comprise a "Geoscience Zone" at this popular conference. Dr. Corey Garza, PBC Co-Chair, serves on the SACNAS Board and CR staff will work the booth.

Accomplishments this period:

1. *Monthly Meetings*: The CR met each month in the period in a combined call with the Place-based Conservation and Social Science Committees. Dr. Pitter, the CCME Assistant Director, and Dr. Howse, the External Evaluator, also participate in the calls. CR members also sit on other focal area committees and the and Education committees to facilitate collaboration across the Center for an integrated education and research strategy.

2. *Research*: To date, the CR has received and approved four student research proposal synopses for the Coastal Resilience focal area and adopted one other.

a. Mallory Brooks, Master's Student, Bethune-Cookman University, "Evaluating the effectiveness of restored shorelines in mitigating non-point source pollution and climate impacts in the Mosquito Lagoon, Florida, USA," Advisor: Hung Jung (J.) Cho (approved)
b. Cristina Madrid, Master's Student, UTRGV, "Local Disaster Coordination in the Rio Grande Valley", Advisor: Owen Temby (approved)
c. Samuel Mwenda, Master's Student, Bethune-Cookman University, "Assessing Treatment Wetland Efficacy and Public Education in Stormwater Treatment Utilizing Native Plants", Advisor: Hung Jung (J.) Cho (approved)
d. Miya Pavlock McAuliffe, Master's Student, California State University Monterey Bay, "Quantifying Sediment Transport Along a Rocky Embayed Coastline: The Southern Monterey Bay, CA", Advisors: Rikk Kvitek (CSUMB) & Ivano Aiello (MLML) (approved)
e. Diana Del Angel, Ph.D. student, TAMUCC, "Assessment of Salt Marsh Ecosystem Services in the US Gulf of Mexico", Advisor: David Yoskowitz (dual focus approved by PBC)

3. *NERTOs*: Two SSIOs have been completed and the remaining two have been drafted.

4. *Leveraged Funding*: New grants/projects for CCME CR faculty:

a. Dr. Yoskowitz's proposal entitled "Ecological Effects of Sea Level Rise (EESLR) Program", funded in the amount of $120,000, will provide outputs that student Diana Del Angel will use for her dissertation.
b. Richard McLaughlin received a National Academy of Science award in the amount of $164,336 entitled "Gulf of Mexico Student Workshop on International Marine Management". The grant funds U.S./Mexican/Cuban students to study and train together on a coastal resiliency topic in Cuba. CCME student Diana Del Angel will participate in the workshop.

5. *Core Competencies*:

a. The CR added two of the social science core competencies that were developed during the reporting period to their list.

b. The CR determined to ensure that modules for the CWCC are developed in alignment with the core competencies.

6. *2019 CWCC Development*:
a. The CR identified faculty lectures to update and provide.
b. Additional NOAA resources were identified and reviewed.
c. Leadership set a timeline and made assignments for online module curation and development.

7. Outreach and Recruitment:
a. CR members drafted a session proposal for the Coastal and Estuarine Research Federation (CERF) conference that will allow CCME and other CSC scholars to showcase their work. The conference will be in Mobile, AL in November 2019 but session proposals are due September 20, 2018.
b. CCME reserved a booth to be co-located with NOAA at the October 2018 SACNAS conference in San Antonio. CR staff and students will help staff the booth.

8. The CR developed *Year 3 goals and strategies* (appended below).

CCME Coastal Resilience (CR) Year 3 Goals and Strategies

Goal 1.
Recruit 3 more students (CCME Goal 1, Year 3 Milestones)
Strategies:
A. Work with the Coastal & Estuarine Research Federation (CERF) and their biennial conference to recruit underserved, underrepresented students.
- Promote CCME through participation in their existing underserved, underrepresented initiative.
- Leverage opportunities presented by the fact that NOAA generally provides funding for the conference and NOAA scientists we need to connect with participate significantly.
- Conduct CCME recruitment activities at CERF since their biennial conferences run during the intervening years between NOAA EPP Biennial Forums.

B. Determine which CCME institutions may have existing and future openings that could be filled by potential CR students.
- Ask FAMU to provide a running inventory of available student openings at each consortium institution.

C. Promote graduate fellowships to CCME undergraduate students
- Work with partner institutions to place qualified undergraduate students into available CR graduate positions.

Goal 2.
Facilitate student progress toward NERTO completions (CCME Goals 1, 2, 3)
Strategies:
A. Work with CR students and faculty to identify/schedule NERTOs.
B. Work with FAMU and EPP to monitor student progress and assist, where appropriate.

C. Assist with proposal synopsis approval process to obtain NOAA assistance securing mentors and NERTOs.
D. Circulate potential NERTO opportunities that achieve CR Objectives.
E. Circulate CR Core Competencies and encourage NERTO alignment with them.

Goal 3.
Facilitate student training opportunities and ensure alignment with CR core competencies (CCME Goals 1, 2, 3)
Strategies:
A. Develop the 2019 CWCC course based on CR core competencies.
B. Map training curriculum, including CWCC, webinar, and online courses, to CR core competencies and provide that information to CCME PIs.
C. PIs and faculty advisors monitor and ensure student attainment of CR core competencies.

Coastal Intelligence Summary

In the current reporting period, CI has a total of 18 active CCME Scholars (4 Ph.D., 6 M.Sc. and 8 B.Sc. pursuing students, including a community college transfer student (CI Table 1). This includes one new Ph.D. and two new B.Sc. students; one undergraduate is no longer affiliated with the CCME. One CCME graduate student presented and had her synopsis approved by the CI this reporting period. In total, CI has approved six (2 Ph.D. and 4 M.Sc.) student proposal synopses (CI Table 1). Eight (of the ten) CCME CI Graduate Scholars have identified NOAA and NOAA NERTO mentors (CI Table 2). One additional Scholar completed their NERTO during this period, for total of three NERTOs completed. One Scholar participated in a pre-NERTO internship with plans to conduct the NERTO next summer. One additional Scholar completed the SSIO paperwork for the their NERTO.

Dr. Emily Jones, the second CCME Postdoctoral Researcher, joined the CCME and CI this June at FAMU. She is developing her research plan with a focus upon mangroves in North Florida; connections with the Apalachicola NERR and other potential research site have been initiated. There was conference call with Dr. Chris Kelbe at AOML in Miami to identify potential NOAA mentors and to develop the project for her NERTO. Two CCME PCB Scholars and their mentors also participated. Dr. Jones and one CCME CI Scholar will be traveling to AOML for a face-toce meeting this October to discuss NERTOs and NOAA mentors.

There are 15 CI faculty mentors at the six institutions, with a subgroup that meets for monthly CCME CI conference calls. Also participating in the calls are NOAA representatives, the CCME Assistant and Associate Directors, the Education Lead, the Social Science Lead, the Distinguished Research Scientist, and the Postdoctoral Researcher. CI faculty members also serve as advisors and supervise student projects submitted to other focal areas in the realms of Place-Based Conservation and Coastal Resilience, as many of the student projects cross-cut the focal areas.

The CI focal area developed and approved the Year 3 CI goals and strategies and CI student core competencies, with input from the CCME Education Team and External Evaluator. The CI has developed a webinar to provide training in the core competencies. The CI faculty are revising

and developing 2019 CWCC material aligning with the CI competencies. CCME students and faculty continue to engage in numerous research/outreach/education/community events and activities aligning with CI at the campus, local, regional, and national scales. A key activity was the participation of two CCME CI Scholars, along with other CCME Scholars, in the Capitol Hill Ocean Week (CHOW) June 5-7, 2018.

CI Table 1. Current Coastal Intelligence Scholar Information.

	CCME Scholar	**Degree Level**	**Faculty Advisor(s)**	**Synopsis Title**	**Synopsis Presented by end of report period**
1	Cockett, Patricia	D	Paul Montagna	Investigating Anthropogenic Impacts on Coastal Marine Systems: The Ahupua'a Concept	Y
2	Margarette Bayron-Arcelay	D	Michael Martinez-Colon	It takes two to tango: protist and bacteria as bioindicators of estuarine health in FL and TX	N
3	Uwaibi, Ariana	D	Richard Long Michael Abazinge	In development, Harmful Algal Blooms, started Fall 2018	N
4	Walker, Lily	D	Michael Wetz	Dissolved Oxygen Dynamics in Texas Estuaries	Y
5	Alanis, Brianna	M	John Breier	Using primary productivity proxies as ecosystem health metrics	Y
6	Etienne (Stanley), Ra'Teema	M	Hongmei Chi	Predict Florida Beach rip current via Data Analytics Techniques	N
7	Guruvadoo, Shan	M	H.J. Cho	Investigating causes of changing tidal range and timing in U.S. harbors	Y
8	Lascelles, Nigel	M	Charles Jagoe		N
9	Rosa-Marin, Angelique	M	Michael Martinez-Colon	Implementation of the FORAM Index (FI) in coral reefs from Jobos Bay at Puerto Rico	Y
10	Vidal, Prian	M	Charles Jagoe and Elijah Johnson	Nitrogen sequestration associated with oyster aquaculture in the Oyster Bay, Aquaculture Use Zone, Wakulla Co, FL	N

11	Boisen, Olivia	B	John Goeltz	Effects of Ionic Strength on Carbonate Equilibria and pH measurement	N/A
12	Chui, Emily	B	Alison Haupt	Patterns of mussel recruitment in Monterey, Bay	N/A
13	Garcia, Javier	B.	John Breier	Using deep learning computer vision techniques to better manage ocean sensing data storage and transmission needs	N/A
14	Jones, Kennedy	B	Ranjani Kulawardhana	Developing geospatial datasets for evaluating LULC and climate variability of coastal MS	N/A
15	Hamilton, Alexis	B	Richard Long	Impact of Pharmaceuticals and Personal Care Products (PPCPS) on Estuarine Microbes and their Ecosystem Service	N/A
16	Meredith, Melissa	B	Cheryl Logan	Effects of climate change induced ocean acidification and hypoxia on early life stages of rockfishes	N/A
17	Rolle, Shaquila	B.	Richard Long	Impact of Pharmaceuticals and Personal Care Products (PPCPS) on Estuarine Microbes and their Ecosystem Service	N/A
18	Terrius, Bruce	T	Richard Long	In development, started Fall 2018	N/A

CI Table 2. NERTO Status of the CI Graduate Scholars

CCME Scholar	**NOAA mentor**	**NOAA NERTO mentor**	**NERTO Project Title**	**NERTO Dates**	**NERTO Location**
Cockett, Patricia	Randall Kosaki	Randall Kosaki	Quantify the Ecosystem Service Values of Freshwater Inflow with Respect to Recreational Use of the NOAA Hawaii Estuarine Research Reserve (NERR)	Summer 2019	NOS: National Marine Sanctuaries Honolulu, Hawaii

Margarette Bayron-Arcelay	Cheryl Woodley (need to confirm)	Cheryl Woodley	*In discussion*	Summer 2019	NOS: NCCOS Hollings Marine Lab Charleston, North Carolina
Uwaibi, Ariana	*Actively Seeking*	*Actively Seeking*			
Walker, Lily	Suzanne Bricker	Suzanne Bricker	*In discussion*	Summer 2020	NOS: Co-Op Oxford Lab, Oxford, MD
Alanis, Brianna	*Actively Seeking*	*Actively Seeking*			
Etienne (Stanley), Ra'Teema	Michael Churma	Michael Churma	Investigate Dataset and Images from Rip Current	Summer 2019	National Weather Service, Silver Spring, MD
Guruvadoo, Shan	Greg Dusek Chris Zervas	Greg Dusek Chris Zervas	Investigating Causes of Changing Tidal Range and Timing in U.S. Harbors	8/14/2017-11/3/2017	NOS: Co-Op, Silver Spring, MD
Lascelles, Nigel		Ashok Deshpande	Chemical Characterization of Microplastics Pollution in Coastal Water	Summer 2018	Northeast Fisheries Science Center, Sandy Hook, New Jersey
Rosa-Marin, Angelique	Cheryl Woodley	Cheryl Woodley	Exploring the Use of Foraminifera as a Bioassay Organism for Coral Reef Environments	Summer 2019	NOS: NCCOS Hollings Marine Lab Charleston, North Carolina
Vidal, Prian	Suzanne Bricker	Suzanne Bricker	*In discussion*	Spring 2019	NOS: Co-Op Oxford Lab, Oxford, MD

CI Table 3: Coastal Intelligence Focal Area Committee Members

Institution	**Faculty and Staff**

CCME FAMU	Hongmei Chi, Charles Jagoe, Elijah Johnson, Emily Jones, Richard Long (co-Lead), Michael Martinez-Colon, Steve Morey Michael Abazinge, Bernadette Kelley, Phyllis Gray-Ray, Sharmini Pitter
CCME B-CU	Hyun Jung ("J.") Cho
CCME CSUMB	Corey Garza (Additional UG mentors: John Goeltz, Alison Haupt, Cheryl Logan)
CCME JSU	Ranjani Kulawardhana, Timothy Turner
CCME TAMUCC	Paul Montagna (co-Lead), Mike Wetz, Mikell Smith
CCME UTRGV	John “Chip” Breier

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

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

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

Report of Year 2 CCME CI Goals:

Target Goals for Year 2

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

CCME Scholar CI Competencies:

CCME Scholar will demonstrate knowledge and understanding of:

1. The elements of sea-level rise observation networks and their relationship to sea-level rise projections.
2. The leading stressors on ecosystem processes and their relationship to ecosystem health.

3. Archived, existing, and new data streams that support ecosystems dynamics and research.
4. Widely-used databases and decision-support tools that address coastal hazards.
5. Best practices for ecosystem assessment and restoration.
6. Demonstrate the use of communication approaches to deliver more effective warnings about coastal resources and coastal hazards.
7. Evaluate a select suite of products and services to confirm the integration and effective use of social science into coastal intelligence research.

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

Progress towards achieving the Year 2 Objectives and Scholar Competencies

- The CI educational subcommittee made an inventory of CI research and classroom activities (e.g. capstone courses) which can be leveraged to increase student engagement and understanding of coastal intelligence, including tools and technology employed for assessment.
- CCME CI received input from the External Evaluator on CI competencies; these are listed above. In response, CI has developed an online workshop/seminars series incorporating NOAA scientists, CCME scientists and online resources to facilitate the above competencies.
- OneNOAA Science Seminars announcements relevant to CI have been circulated to the scholars. CI has interacted with NOAA scientists, accessed the NOS Roadmap, received input from NOAA technical monitors, the Community Stakeholders Advisory Board, and the NOAA CCME Advisory Council as we move to developing CCME Scholars.
- CI presented an overview of the focal area's Scholars and research to the CCME Community Stakeholder Advisory Board on August 1, 2018, in attempt to increase their involvement in monthly calls.

Accomplishments this reporting period:

1. Status of Scholars (CI Table 1):
    a. The CI focal area has a total of 18 students from the six CCME institutions: 4 Ph.D., 6 M.Sc., and 8 B.Sc. scholars, including one 1 community college transfer.
    b. The demographic of the Scholars:
        - 7 African American/Black; 2 Asian/Asian American; 1 Caucasian; 5 Hispanic; 2 Mixed and 1 Pacific Islander (94% ethnic minority)
        - 13 females and 5 males.
    c. Three new Scholars (1 Ph.D. and 2 B.Sc.) were recruited during this period (included in a & b).
2. Student synopses submitted to and approved by CI (CI Table 1)
    a. One new student synopsis was presented and approved.

   b. A total of six synopses have been presented and approved at the focal area (one Scholar graduated in a previous reporting period and is not included in CI Table 1).
   c. In addition to their written synopsis, Scholars are now required to provide an oral presentation of their synopsis to the focal area during the monthly calls.

3. Student NERTO updates (CI Table 2)
   a. Eight of the graduate Scholars have identified NOAA research mentors and/or NERTO mentors. One graduate Scholar completed his NERTO during summer 2018.
   b. One graduate CI Scholar is attending a meeting with Dr. Chris Kelble and others at AOML in Miami to identify a NERTO mentor in the first week of October.

4. Postdoctoral update
   a. Dr. Emily Jones joined the CCME and CI this reporting period. She has been networking with local stakeholders and managers in preparation for her research, as she develops her Post-Doctoral Research Plan and Career Roadmap to submit in the near future. Discussions with Dr. Chris Kelble at AOML in Miami are underway to identify a NERTO mentor. An in-person meeting is scheduled for the first week of October.

5. Recruiting Events
   a. Drs. Long and Pitter, and Ms. Crystal Flowers (FAMU transfer coordinator) spoke to the Tallahassee Community College STEM Club, March 7th, 2018.

6. *Leveraged Funding:* New grants/projects for CCME CI faculty:
   a. 2018-2019 Montagna, P., TAMUCC, "Using Comparative Long-term Benthic Data for Adaptive Management of Freshwater Inflow to Three Basins," Texas Water Development Board. $135,000 *Supports data collection for doctoral student studies, and advances focus on coastal intelligence.
   b. 2018-2019 Wetz, M.S., TAMUCC**,** "Influence of freshwater inflow gradients on estuarine nutrient-phytoplankton dynamics", *awarded* by Texas Water Development Board. $100,000 *Supports data collections that will be used by CCME CI student Lily Walker in her dissertation
   c. 2018-2021 Wetz, M.S., TAMUCC**,** "Baffin Bay water quality study", *awarded* by Celanese Corporation. $150,000 *Supports data collections that will be used by CCME CI student Lily Walker in her dissertation

Place-based Conservation Summary

The Place-Based Conservation Focal Area (PBC) has a total of 27 students from the six CCME institutions: 3 Ph.D., 11 M.S., and 11 B.S level, and 2 transferred students. Among the 14 graduate students, 10 presented their research synopses to the focal area faculty (PBC Table 1). The presented synopses were reviewed, edited, and approved at the PBC level and submitted to the CCME Management Team. Eight of the graduate students have identified NOAA research mentors and/or NERTO mentors (PBC Table 2). Two graduate students completed their NERTO during summer 2018; two have been approved for the spring 2019 NERTO. Postdoctoral researcher, Dr. Easton has been approved for her 6-month NERTO tenure at the NOAA's Deep-Sea Coral Ecology laboratory at NCCOS in Charleston, South Carolina. Currently, the focal area consists of 23 regular faculty members (PBC Table 3) and conducts monthly conference calls in

conjunction with the CR and the Social Science team. PBC core competencies have been reviewed and approved. In order to facilitate assessment, a competency matrix chart is being completed through inputs from the CCME institutions of their degree programs' curricula and required activities for students. The PBC is developing and revising CWCC on-line modules aligning with the competencies to meet the deadline of December 1st, 2018. CCME students and faculty are actively engaged with numerous research/outreach/education/community events and activities aligning with PBC at the campus, local, regional, and national scales.

PBC Table 1. Current PBC Student Information.

CCME Scholar	**Degree Level**	**Research Interest**	**Synopsis**	**Faculty Advisor(s)**	**NOAA/ NERTO Mentor**	**NERTO Site**
Abraham DaSilvio	M	Water quality and treatment through natural wetlands	Yes	J. Cho	TBD	AOML, Miami, FL
Lauren Parker	M	Rock Reef Ecology and Fisheries	Yes	James Lindholm	Andrew DeVogelearre (Both)	MBNMS Office
Taylor Eddy	M	Marine Protected Areas	Yes	Corey Garza	Charles Wahle (Both)	National MPA Center
Geramy Perriman	B	Ecology of polychaete worms associated with sand beaches	N/A	Brent Thoma	N/A	N/A
Harrison R. Watson	B	Mitogenomic rearrangements in sandhoppers (Amphipoda)	N/A	Brent Thoma	N/A	N/A
Jada Grant	B	Ecology echinoderms associated with sand beaches	N/A	Brent Thoma	N/A	N/A
Jessica Webb	B	Mitogenomic rearrangements in gammarid amphipods	N/A	Brent Thoma	N/A	N/A
Shelby Windham	B	Ecology of amphipod crustaceans associated with sand beaches	N/A	Brent Thoma	N/A	N/A
Shirlay Alexander	B	Ecology of macroinvertebrates associated with seagrass habitats	N/A	Brent Thoma	N/A	N/A
Julian Venable	M	Microplastics in GBNERR	No	Ibrahim Farah/Brent Thoma	Seeking	Seeking

Keenasha Minor	M	Determination of Natural occurring radionuclides in the GoMx	No	Fengxiang Han	Seeking	Seeking
Jonathan Breaux	T	Ecology of bivalve molluscs associated with sand beaches	N/A	Brent Thoma	N/A	N/A
Liyah Smith	T	Tanaid crustacean taxonomy	N/A	Brent Thoma	N/A	N/A

PBC Table 1 continued

CCME Scholar	**Degree Level**	**Research Interest**	**Synopsis**	**Faculty Advisor(s)**	**NOAA/NERTO Mentor**	**NERTO Site**
Diana Del Angel	D	Socioeconomic sciences	Yes	David Yoskowitz	Rebecca Allee (NOAA mentor only)	In discussion with Mary Culver on NERTO at Office of Coastal Management in Charleston
Elizabeth Del Rosario	D	Environmental flows policy and regulations	Yes	Richard McLaughlin	Trey Flowers (NOAA mentor & NERTO mentor)	National Water Center, Tuscaloosa, AL (Summer 2019)
Kelsey Martin	D	Red snapper fishery populations	No	Greg Stunz	Matthew Campbell (NOAA mentor, NERTO TBD)	Seeking
Meghan Martinez	M.S.	Oyster ecology	Yes	Jennifer Pollack	Dionne Hoskins-Brown (NOAA mentor only)	In discussion with Dr. Hoskins-Brown about a NERTO mentor
Cassandra Rodriguez	B.S.	Marine Veterinary Medicine	N/A	David Hicks	N/A	
Daniel Flores	B.S.	Conservation and restoration; understanding threats to estuarine ecosystems	N/A	Alejandro Fierro	N/A	

		and their services				
David Lecusay	B.S.	Freshwater & coastal ecosystems, and wildlife conservation.	N/A	Carlos Cintra	N/A	
Jaime Lopez	B.S.		N/A	Owen Temby	N/A	
Shelby Bauer	B.S.		N/A	Alejandro Fierro	N/A	
Anthony Lima	M.S.	Fishery management, aquaculture, and marine resource management.	Yes	Owen Temby	NERTO mentor: Scott Large, Ph.D.	National Marine Fisheries Service: Northeast Fisheries Science-Ecosystem Dynamics and Assessment
Ashley Murphy	M.S.	Freshwater & coastal ecosystems, and wildlife conservation.	Yes	Carlos Cintra	Pending	
Javier Navarro	M.S.	Estuarine processes and plant interactions.	Yes	Alejandro Fierro	Pending	
Rebekah Hernandez	M.S.	Assessing long-term benthic community dynamics at the Flower Garden Banks National Marine Sanctuary	Yes	David Hicks	NERTO mentor: Michelle Johnston, Ph.D.	Office of National Marine Sanctuaries: Flower Garden Banks National Marine Sanctuary. she completed her NERTO during the summer 2018 (May- August).
Victoria Salinas	M.S.	Healthy Oceans/ Coral reefs	No	David Hicks	Pending	

PBC Table 2. NERTO Status of the PBC Graduate Students

NOAA CCME Semi Annual Performance Report
(March 1 - August 31, 2018)
Larry Robinson, Principal Investigator and Center Director

CCME Scholar	**Degree Level**	**Graduate Student Academic Advisor(s)**	**NERTO Dates**	**NERTO NOAA Mentor**
Abraham DaSilvio	M	J. Cho	Spring 2020	AOML, NERTO mentor TBD
Lauren Parker	M	James Lindholm	Fall 2018	Dr. Andrew Devogelaere, Research Coordinator, Monterey Bay NMS
Taylor Eddy	M	Corey Garza	Fall 2018	Dr. Charlie Wahle, Senior Scientist, NOAA National Marine Protected Areas Center (Approved)
Keenasha Minor	M	Fengxiang Han	Seeking	Seeking
Julian Venable	M	Ibrahim Farah/Brent Thoma	Seeking	Seeking
Meghan Martinez	M	Jennifer Pollack	Summer 2019	Dionne Hoskins-Brown (NOAA mentor only) Seeking NERTO mentor – Dr. Dionne Hoskins-Brown is assisting.
Diana Del Angel	D	David Yoskowitz	Spring 2019	Rebecca Allee (NOAA mentor only) talking with Mary Culver on NERTO at Office of Coastal Management in Charleston
Elizabeth del Rosario	D	R. McLaughlin	Summer training June 10 - July 28, 2018; NERTO Summer 2019	Dr. Trey Flowers, P.E.
Kelsey Martin	D	Greg Stunz		Matthew Campbell (NOAA mentor, NERTO TBD)

Rebekah Hernandez	M	David Hicks	June - 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 (**Completed**)
Anthony Lima	M	Owen Temby	June 4th - August, Summer 2018	Dr. Scott Large, Northeast Fisheries Science Center, NMFS (**Completed**)
Ashley Murphy	M	Carlos Cintra Buenrostro	Seeking	Seeking - Dr. Chris Kelble, AOML is assisting
Javier Navarro	M	Alejandro Fierro-Cabo	Seeking	Seeking - Dr. Chris Kelble, AOML is assisting

PBC Table 3. Place-based Conservation Focal Area Committee Members

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

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

NOAA CCME Semi Annual Performance Report
(March 1 - August 31, 2018)
Larry Robinson, Principal Investigator and Center Director

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

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

Report of CCME PBC Competencies: The PBC worked with External Evaluator to finalize the following six competencies for the PBC students to achieve prior to their completion of the CCME program. In order to facilitate assessment of the students meeting the required competencies, a competency matrix chart is being completed through inputs from the CCME institutions of their degree programs' curricula and required activities for students. New PBC CWCC online modules are being designed to ensure the exercises and information will enable the students to gain the competencies if successfully completing the modules.

1. The natural and nature-based infrastructure that address the impact of extreme weather on coastal ecosystems and communities.
2. The community-based approaches for the preservation, fortification, and enhancement of natural and nature-based coastal infrastructure.
3. The models for community-based approaches for assessing the vulnerabilities and value of proposed solutions relating to the impact of extreme weather and sea-level rise on coastal ecosystems and communities.
4. The tools used to study natural and nature-based infrastructure that mitigate the impact of extreme weather and sea-level rise on coastal communities and ecosystems.
5. Integrating models and practices and other decision-making tools for ecosystem-based management.
6. Advocating for the accountability of social science in planning and budgeting to enhance coastal community projects.

Accomplishments this reporting period:

7. Status of Students (Table 1):
    a. The PBC focal area has a total of active 27 students from the six CCME institutions: 3 Ph.D.; 11 M.S.; and 11 B.S level and 2 transferred students.
        - Additional 17 students were added to the focal area since March 2018 (11 B.S., 4 M.S., and 1 Ph.D. students)
    b. The demographic of the students
        - 10 African American; 11 Hispanic; and 6 Caucasian
        - 10 male and 17 female students
8. Student synopses submitted to and approved by PBC (PBC Table 1)
    a. One new student synopsis was presented and approved.
    b. Three of the previously presented synopses were approved during the reporting period and submitted to the CCME Management Team through Taskstream.

c. Total of 10 synopses have been presented and approved at the focal area.

9. Student NERTO updates (PBC Table 2)

a. Eight of the graduate students have identified NOAA research mentors and/or NERTO mentors. Two graduate students completed their NERTO during summer 2018; two have been approved for the spring 2019 NERTO.

b. Anthony Lima and Rebekah Hernandez, of CCME UTRGV had their NERTOs in summer 2018.

10. Postdoctoral NERTO application submitted and approved

a. Dr. Erin Easton received the approval for a 6-month NOAA tenure at Charleston, SC in the Deep Coral Ecology Laboratory of Peter Etnoyer. Her NERTO will start in March 2019. She will be working on a *Hypnogorgia* and/or *Swiftia* genetic project. Dates and details will be settled at a meeting in December.

11. Leveraged Research/Training/Outreach Activities

a. Outreach Events

- Dr. Cristina V. Torres and Elizabeth Murphy (CCME graduate student) Memorial Astronomical Observatory Inauguration Event, Marine Debris Education, Resaca de la Palma State Park, May 5th 2018 (CCME UTRGV)
- Carlos E. Cintra Buenrostro (CCME faculty) led the floating classroom and lower Laguna Madre (Spring 2018) activities targeted to increase the student body in the STEM fields, particularly Geosciences, students were presented with marine debris activities, floating classroom cruise and marine specimen collection/identification/discussion. Students involved 20-25 (CCME UTRGV)
- The Earth Day Activity hosted by CCME TAMUCC had over 800 participants.
- Several summer science teaching and event were conducted by CCME faculty and hosted on partnering institutions
- Public education and outreach activities such as Shark Week Premiere and multiple other workshops and events by CCME TAMUCC attracted >1,000 participants.
- CCME B-CU hosted a native plant planting at one of the research sites (treatment wetland converted from a dump site owned by a city) and had >25 local volunteers participating in the planting in August 2018.
- CCME B-CU students hosted a workshop on use of native plants in stormwater management projects to the Florida Native Plant Society.
- CCME B-CU students mentored a high school student CCME B-CU students have been mentoring a local high school student on his project conducted through the CCME B-CU laboratory and in the field over the summer. The high school intern started the study in June 1st, 2018 and continuing his samplings of water quality.

12. *Leveraged Funding:* New grants/projects for CCME PBC faculty:

There are no new leveraged project acquired during the reporting period. However, several leveraged projects are ongoing:

a. Commercial Launch Site Species Monitoring Survey (Construction Phase: 2017-2018); SpaceX, D.W. Hicks (CCME UTRGV),
b. The South Texas Banks Ecosystem: Oceanography, Biodiversity and Genetics. Texas Sea Grant Program, 2015-2017. $179,027. Diego Figueroa and David Hicks (CCME UTRGV). Includes collaborative works with The Flower Garden Banks National Marine Sanctuary and NOAA's Deep Sea Coral Research and Technology Program's Southeast Deep Coral Initiative (SEDCI). Includes CI related activities such as multibeam bathymetry, multibeam fisheries assessments, water quality, and ROV surveys of fish and invertebrate populations.
c. Mesophotic Reef Anchoring Impact Study. NOAA CR Funding. To begin in 2018, David Hicks (CCME UTRGV)
d. Implementing and Evaluating Living-Shorelines as Controls for Nonpoint-Source Pollution and as a Tool for Public Education. The Scientific Research Disaster Recovery Grants of the Gulf Research Program. The National Academies of Sciences, Engineering, and Medicine, $46,000. 2018-2019 (CCME B-CU) - Supports data collection and sampling processing fees for CCME student
e. Tree Fund for Reed Canal Basin Stormwater Improvement through Treatment Wetland Construction in South Daytona, FL, Volusia County, 2018. $20,000, (CCME B-CU) - Construction of treatment wetland for CCME students
f. Wetland plant grant from Volusia County. Volusia County, 2018. $5,000 (CCME B-CU) - Construction of treatment wetland for CCME students
g. Reed Canal Basin Stormwater Improvement through Treatment Wetland Construction in South Daytona, FL, Indian River Lagoon National Estuary Program, $181,148, 10/1/2017-09/30/2019 (CCME B-CU) - Construction of treatment wetland and sampling processing fees for CCME students
h. Implementing and evaluating the effectiveness of native vegetative buffers at controlling nonpoint source pollution and as a tool for public education along the Indian River Lagoon, FL Department of Environmental Protection and EPA. $494,693 (CCME B-CU) - Supports data collection and sampling processing fees for CCME student
i. Estimating absolute abundance of Red Snapper in the Gulf of Mexico, Sea Grant/NOAA/USM, $9,500,000, Greg Stunz (CCME TAMUCC).
j. NFWF-Connecting Youth to Coastal Habitat Restoration in Texas, National Fish & Wildlife Foundation, $249,293, Jennifer Pollack, (CCME TAMUCC).

II. Products of Award

Degrees Awarded: Award Total: 4 B.S., 1 M.S.

Student Publications in Journals: No student publications were completed during the current reporting period.

Faculty Publications in Journals:

NOAA CCME Semi Annual Performance Report
(March 1 - August 31, 2018)
Larry Robinson, Principal Investigator and Center Director

Faculty Member Name	Title	Journal/Proceedings
Alejandro Fierro, Ph.D.	Biological assessment of dune restoration in south Texas	*Ocean and Coastal Management 163:466-477*
David Hicks, Ph.D.	Biological assessment of dune restoration in south Texas	*Ocean and Coastal Management 163:466-478*
Michael Wetz, Ph.D.	Phytoplankton spatial variability in the river-	Estuaries and Coasts
Michael Wetz, Ph.D.	dominated estuary, Apalachicola Bay, Florida	
Michael Wetz, Ph.D.	Moving forward in a reverse estuary: movement and habitat use of Black Drum (Pogonias cromis) under distinct hydrological regimes in Baffin Bay, Texas	Estuaries and Coasts
Michael Wetz, Ph.D.	Biogeochemistry of a river-dominated estuary (Apalachicola Bay, Florida) influenced by drought and storms	Estuaries and Coasts
Paul Montagna, Ph.D.	Blomberg, B.N., J. Beseres Pollack, P.A. Montagna and D.W. Yoskowitz. 2018. Evaluating the U.S. Estuary Restoration Act to inform restoration policy implementation: A case study focusing on oyster reef projects	Marine Policy 91: 161–166.
Paul Montagna, Ph.D.	Montagna, P.A., X. Hu, T.A. Palmer, and M. Wetz. 2018. Effect of hydrological variability on the biogeochemistry of estuaries across a regional climatic gradient.	Limnology and Oceanography doi: 10.1002/lno.10953
Paul Montagna, Ph.D.	Blomberg, B.N., T.A. Palmer, P.A. Montagna, and J.B. Pollack. 2018. Habitat assessment of a restored oyster reef in South Texas.	Ecological Engineering 122: 48-61. doi: 10.1016/j.ecoleng.2018.07.012
Paul Montagna, Ph.D.	Middleton, B.A., and P.A. Montagna. 2018. Turning on the faucet to a healthy coast.	The Solutions Journal 9(3) https://www.thesolutionsjournal.com/article/turning-faucet-healthy-coast/
Paul Montagna, Ph.D.	Del Rosario, E.A., and P.A. Montagna. 2018. Effects of the Rincon Bayou Pipeline on salinity in the upper Nueces Delta.	Texas Water Journal 9:30-49. https://twj.media/rincon-bayou-pipeline/
Richard McLaughlin, Ph.D.	Managing Areas Beyond National Jurisdiction in the Gulf of Mexico: Current and Developing Legal Authority and Future Challenges	9 Sea Grant Law and Policy Journal, 16-40 (2018)
Richard McLaughlin, Ph.D.	Sea-level Rise Policy Analysis for Texas	9 Sea Grant Law and Policy Journal, 41-70 (2018)
Richard McLaughlin, Ph.D.	Improving Cooperation in U.S./Mexican Marine Science to Better Manage Offshore Hydrocarbon Activities in the Gulf of Mexico	Proceedings: The Gulf of Mexico – Workshop on International Research. New Orleans (LA): U.S. Dept. of Interior, Bureau of Ocean Energy Management. OCS Study BOEM 20xx-xxx 239

		pp.
Jennifer Pollack, Ph.D.	Habitat assessment of a restored oyster reef in South Texas	Ecological Engineering
Jennifer Pollack, Ph.D.	Evaluating the U.S. Estuary Restoration Act to inform restoration policy implementation: a case study focusing on oyster reef projects	Marine Policy
Jennifer Pollack, Ph.D.	Dietary composition of black drum (Pogonias cromis) in a hypersaline estuary reflects water quality and prey availability	Journal of Fish Biology
Jennifer Pollack, Ph.D.	Moving forward in a reverse estuary: habitat use and movement patterns of Black Drum (Pogonias cromis) under distinct hydrological regimes	Estuaries and Coasts
Greg Stunz, Ph.D.	2018 Moving Forward in a Reverse Estuary: Habitat Use and Movement Patterns of Black Drum (Pogonias cromis) Under Distinct Hydrological Regimes	Estuaries and Coasts
Greg Stunz, Ph.D.	Effects of a New Artificial Reef Complex on Red Snapper and the Associated Fish Community: an Evaluation Using a Before-After Control-Impact Approach	Marine and Coastal Fisheries
Hongmei Chi, Ph.D	Investigation of Florida Housing Prices using Predictive Time Series Model	In Proceedings of the Practice and Experience on Advanced Research Computing (PEARC '18). ACM, New York, NY, USA, Article 92,
Hongmei Chi, Ph.D	Integrating Travel and Epidemic Models for Vector Borne Disease Surveillance	7th International Conference on Innovations in Travel Modeling (ITIM). National Academies Transportation Research Board. 2018.

Editor of Special Journal Issues
Books:
Book Chapters:

Thesis/Dissertations:

Philip Bellamy, (2017) *A GIS Tool for Determining the Potential Runoff Coefficient and Runoff Depth for the Indian River Lagoon, FL*. Master's thesis. Bethune-Cookman University, Daytona Beach, FL.

Conference Papers, Posters and Presentations:
Student Presentations

Student Name	Title	Conference/Meeting/Other
Lauren Parker	The ecology of organisms on the lost reefs of the Monterey Bay National Marine Sanctuary	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Taylor Eddy	Multiscale habitat use and MPA effects on California Spiny lobster success	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Miya Pavlock-McAuliffe	Lasers and Sonar: Integrating technology to research pocket beach dynamics in Monterey, CA	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Emily Chui	Identification of mussel recruits from field collections	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Olivia Boisen	Quantifying the cross-sensitivity of glass pH electrodes in high pH solutions	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Melissa Meredith	Effects of ocean acidification and hypoxia on larval brown rockfish transcriptomes	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Anthony Lima	Mapping and Measuring Interagency Communication throughout the Gulf of Mexico Fishery.	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Ashley E. Murphy	Assessing and quantifying nitrogen transfer through Black Mangrove (Avicennia germinans) communities. Poster	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Rebekah Hernandez	Southward expansion of Lionfish (Pterois spp.) across mesophotic coral ecosystems of the Texas Gulf of Mexico (Poster presentation). Poster	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Ashley E. Murphy	Assessing and quantifying nitrogen transfer through a Black Mangrove (Avicennia germinans) community.	Thesis Proposal Defense- UTRGV
Mallory Brooks	Evaluating the Effectiveness of Living Shorelines in Mitigating Non-point source Pollution and Increasing Soil Carbon Storage in the Mosquito Lagoon Watershed	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Abraham Dasilvio	Implementing Living Shorelines as Tools For Runoff Treatment & Public Education	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Shan Guruvadoo	Investigating Causes of Changing Tidal Range and Timing in the US. Harbors	NOAA EPP/MSI 9th Biennial Education and Science Forum,

		Washington D.C.
Harrison Watson	Effects of Tamoxifen on Reproductive Physiology in Xenopus laevis	UC Berkeley Research Symposium, Berkeley, CA
Harrison Watson	Understanding Infestation of Polydora websteri in Crassostrea virginica to Improve Oyster Farming Methods	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Jessica Webb	The effects of seed mix diversity on the abundance and diversity of pollinators in restored prairies	Kellogg Biological Station Research Symposium
Diana Del Angel	Del Angel, D.C.*, D. Yoskowitz, S. Hagen, and M. Bilskie. Socio-Economic Impact of Storm Surge under Projected Sea Level Rise: Spatial Assessment of Communities at Risk	NOAA Educational Partnership Program with Minority Serving Institutions 9th Biennial Education and Science Forum, Howard University, Washington DC, March 18-21, 2018.
Diana Del Angel	Del Angel, D.C.*, D. Yoskowitz, S. Hagen, and M. Bilskie. Economic Impact Assessment: Storm Flooding Under Sea Level Rise	Gulf Sentinel Site NGOM+N2E2 MTAG Workshop. July 12, 2018, Grand Bay NERR. Moss Point, MS
Elizabeth Del Rosario	Del Rosario, E., R. McLaughlin, P. Montagna. Economic Valuation of Environmental Flows in Texas U.S.A.	World Environmental & Water Resources Congress, June 3-7, 2018, Minneapolis, MN.
Meghan J. Martinez	Martinez, M., Palmer, T., and Pollack, JB. 2018. Influence of Oyster Reef Restoration on Benthic Infauna and Reef-associated Macrofauna	Benthic Ecology Meeting
Lily Walker	The effects of Hurricane Harvey on south Texas water quality	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Lily Walker	Dissolved oxygen dynamics in two south texas estuaries: San Antonio and Baffin Bay	NOAA site visit for Project NA15NOS4780185
Lily Walker	Hypoxia Dynamics in a Semiarid South Texas Estuary	Association for the Sciences of Limnology and Oceanography Summer meeting
Lily Walker	A tale of two storms: wind and rain impacts of Hurricane Harvey	Harvey Research Symposium - *coauthor
Lily Walker	Impact of Hurricane Harvey on benthos.	Harvey Research Symposium - *coauthor
Angelique Rosa-Marin	Implementation of the FORAM Index in coral reefs from Jobos Bay at Puerto Rico	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Alexis Hamilton	Impact of Sulfamethoxazole upon Aquatic Bacterial Organic Matter Utilization and Ecosystem Service	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.

Shaquila Rolle	Impact of Sulfamethoxazole upon Aquatic Bacterial Organic Matter Utilization and Ecosystem Service	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Margarette Bayron-Arcelay	Morphological Response of Benthic Foraminifera to Sediment Composition: Applying Geometric Morphometric for Potential Bio-monitoring	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Margarette Bayron-Arcelay	Contrasting the spatial distribution of dead and live foraminiferal assemblages: applying geostatistics. FORAMS 2018 International Meeting in Edinburgh, Scotland. POSTER	FORAMS 2018 International Meeting in Edinburgh, Scotland. POSTER
Nigel Lascelles	Oysters as sentinels of microplastic pollution in coastal waters	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Prian Vidal	Nitrogen sequestration associated with oyster aquaculture at the Oyster Bay FL Aquaculture Use Zone, Wakulla County, Florida	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Ra'Teema Etienne (Stanley)	Investigate Florida Tourism Trend via Big Data Techniques	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.

Faculty Conference Papers, Posters, and Presentations:

Faculty Member Name	Title	Conference/Meeting/Other
Corey Garza, Ph.D.	The twilight of a keystone interaction? A case study of the Panuliru-Mytilus interaction on Catalina Island	USC Wrigley Institute for Environmental Science summer seminar series.
Owen Temby, Ph.D.	Mapping and Measuring Interagency Communication throughout the Gulf of Mexico Fishery.	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Owen Temby, Ph.D.	Governing Transboundary Fisheries in the Great Lakes: Measuring, Mapping, and Quantifying the Effects of Multidimensional Trust on Interagency Influence within a Binational Network	Annual conference of the New England Political Science Association, Portsmouth, NH, April 20, 2018
John Breier, Ph.D.	Overcoming barriers in time and space: reimagining the possible with robotic oceanography.	Invited Speaker- Gordon Research Conference Marine Microbes
Carlos Cintra. Ph.D.	Assessing and quantifying nitrogen transfer through Black Mangrove (Avicennia germinans) communities.	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.

	Poster	
Alejandro Fierro, Ph.D.	Assessing and quantifying nitrogen transfer through Black Mangrove (Avicennia germinans) communities. Poster	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
David Hicks, Ph.D.	Southward expansion of Lionfish (Pterois spp.) across mesophotic coral ecosystems of the Texas Gulf of Mexico (Poster presentation). Poster	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Erin Easton, Ph.D.	Southward expansion of Lionfish (Pterois spp.) across mesophotic coral ecosystems of the Texas Gulf of Mexico (Poster presentation). Poster	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Erin Easton, Ph.D.	Assessing coral assemblages inhabiting relict coral banks off the south Texas coast.	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
David Hicks, Ph.D.	Assessing coral assemblages inhabiting relict coral banks off the south Texas coast.	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
David Hicks, Ph.D.	Evaluating responses of benthic macrofauna to artificial reef placement in the Gulf of Mexico. Poster	Benthic Ecology Meeting, March 27-30, 2018, Corpus Christi. Texas.
Erin Easton, Ph.D.	Evaluating responses of benthic macrofauna to artificial reef placement in the Gulf of Mexico. Poster	Benthic Ecology Meeting, March 27-30, 2018, Corpus Christi. Texas.
David Hicks, Ph.D.	A review of octocoral distribution in the Northwestern Gulf of Mexico. Poster	Benthic Ecology Meeting, March 27-30, 2018, Corpus Christi. Texas.
Alejandro Fierro, Ph.D.	Assessing and quantifying nitrogen transfer through a Black Mangrove (Avicennia germinans) community.	Thesis Proposal Defense- UTRGV
Carlos Cintra, Ph.D.	Assessing and quantifying nitrogen transfer through a Black Mangrove (Avicennia germinans) community.	Thesis Proposal Defense- UTRGV
Michael Wetz, Ph.D.	Impact of Hurricane Harvey on benthos.	Harvey Research Symposium - *coauthor
Paul Montagna, Ph.D.	Montagna, P. A. What have we learned from studies of offshore platforms, oil seeps, and oils spills?	Benthic Ecology Meeting
Paul Montagna, Ph.D.	Ehrmann, H., Olsen, C., Montagna, P. A., Palmer, T. A., Turner, E. L.Do small volumes of freshwater inflow make a difference?	Benthic Ecology Meeting

Paul Montagna, Ph.D.	Del Rosario, E., McLaughlin, R., Montagna, P. Managing for a "Sound Ecological Environment.	Benthic Ecology Meeting
Paul Montagna, Ph.D.	Jacinto, K.E., Palmer, T. A., Montagna, P. A., Hyde, L. J., Sweet, S. T., Klein, A. G. "Localized anthropogenic effects on the marine environment at Palmer Station, Antarctica.	Benthic Ecology Meeting
Paul Montagna, Ph.D.	Palmer, T. A., Montagna, P. A., Hyde, L. J., Sweet, S. T., et al. "Long-term changes in macrobenthic communities in contaminated sediments and epifauna bioaccumulation adjacent to McMurdo Station, Antarctica.	Benthic Ecology Meeting
Paul Montagna, Ph.D.	Reuscher, M. G., Montagna, P. A. "Taxonomic sufficiency and unidentifiable species in multivariate biodiversity assessments of benthic polychaetes from the northern Gulf of Mexico.	Benthic Ecology Meeting
Paul Montagna, Ph.D.	Rohal, M., Escobar-Briones, E., Montagna, P., Romero, I., et al. "How quickly will the deep sea ecosystem recover from the 2010 DWH oil spill? Lessons learned from the 1979 Ixtoc-1 oil well blowout event.	Benthic Ecology Meeting
Paul Montagna, Ph.D.	Smith, J.K., P.A. Montagna. "Multiple stressor effects on macrobenthic communities in Southeastern Corpus Christi Bay, Texas, U.S.A.	Benthic Ecology Meeting
Paul Montagna, Ph.D.	Montagna, P. Effect of Freshwater Inflow on Biogeochemistry of Estuaries Across a Climatic Gradient	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Paul Montagna, Ph.D.	Montagna, P.A., C. Chaloupka, E. DelRosario, A. Gordon, R. Kalke, T. Palmer, and E. Turner. Managing environmental flows and water resources.	Environmental Impact 2018
Paul Montagna, Ph.D.	Montagna, P.A., M. Hardegree. Long-term changes in estuarine benthos and fish are related to climate change.	Association for Science of Limnology and Oceanography Meeting
Paul Montagna, Ph.D.	Montagna, P.A., L. Hyde, R. Kalke, E. Morgan, L. Walker, M. Wetz. Impact of Hurricane Harvey on benthos.	Harvey Research Symposium
Richard McLaughlin, Ph.D.	Student Focused Development and Support Programs: CCME and SWIMM	Harte Charitable Foundation Meeting, Corpus Christi, TX

Richard McLaughlin, Ph.D.	Findings of a White Paper on Living with Sea Level Rise on the Upper Texas Coast	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Richard McLaughlin, Ph.D.	CCME Lightning Round Presentation	NOAA EPP/MSI 9th Biennial Education and Science Forum, Washington D.C.
Richard McLaughlin, Ph.D.	International Legal Issues in Transnational Oil Spills	Florida Straits Conference, Fort Lauderdale, FL
Jennifer Pollack, Ph.D.	Oyster reef restoration effects on estuarine productivity in St. Charles Bay, Texas	Benthic Ecology Meeting
Jennifer Pollack, Ph.D.	Oyster reef restoration effects on estuarine macrobenthos in St. Charles Bay, Texas.	Benthic Ecology Meeting
Jennifer Pollack, Ph.D.	The effects of a restored oyster reef (Crassostrea virginica) on estuarine nekton and infauna.	Benthic Ecology Meeting
Jennifer Pollack, Ph.D.	Lessons learned from a decade of oyster reef restoration in the Gulf of Mexico	Benthic Ecology Meeting
Greg Stunz, Ph.D.	Rigs-to-Reefs in the Gulf of Mexico	Conference
Greg Stunz, Ph.D.	Estimating Discard Mortality in a Deep-Water Reef Fish; An Evolution in Fate Assignment Using Acoustic Telemetry	Meeting
Michael Martinez-Colon, PhD	Morphological descriptions of Turbellaria cocoons attached to numerous benthic foraminifers from Apalachicola Bay, Florida.	FORAMS 2018 International Meeting in Edinburgh, Scotland.
Michael Martinez-Colon, PhD	Exposure and toxicity of Potentially Toxic Elements in a tropical estuary: Is there a benthic foraminiferal response to bioavailability?	FORAMS 2018 International Meeting in Edinburgh, Scotland.

Technologies or Techniques: Nothing to report at this time.

Patents: Nothing to report at this time.

Inventions: Nothing to report at this time.

Licenses: Nothing to report at this time.

Websites:
NOAA CCME website: ccme.famu.edu
NOAA CCME CSUMB Information page: https://csumb.edu/cme/center-coastal-and-marine-ecosystems
NOAA CCME TAMUCC Information page: https://www.harteresearchinstitute.org/ccme

Other Products: Nothing to report at this time.

III. Participants in Award Performance

Table 2: CCME Award Participants

Name	Most Senior Project Role	Project Hours Worked per Month
Larry Robinson, PhD	Director/Principal Investigator	10
Michael Abazinge, Ph.D.	Associate Director	10
Sharmini Pitter, Ph.D.	Assistant Director	160
Bernadette Kelley, Ph.D.	Education Expert	20
Tonnette Graham	CCME Coordinator	160
Emily Jones, Ph.D.	Postdoctoral Research Associate	160
Steve Morey, Ph.D.	Distinguished Research Scientist	160
Richard Long, Ph.D.	Co-PI, Coastal Intelligence Co-Lead	26
Phyllis Gray-Ray, Ph.D.	Social Science Lead	42
Charles Jagoe, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Elijah Johnson, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Michael Martinez-Colon, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Hongmei Chi, Ph.D.	Big Data Lead	26
Richard McLaughlin, Ph.D.	Principal Investigator	29
David Yoskowitz, Ph.D.	Co-principal Investigator	21.7
Paul Montagna, Ph.D.	Co-principal Investigator	21.7
James Gibeaut, Ph.D.	Co-principal Investigator	21.7
Greg Stunz, Ph.D.	Co-principal Investigator	21.7
Jennifer Pollack, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Michael Wetz, Ph.D.	Faculty advisor	N/A, not budgeted under the award
Mikell Smith	TAMUCC CCME Coordinator	139
J. Cho, Ph.D.	Co-principal Investigator	80 hrs/mo, one summer month budgeted, the rest is leveraged.
Corey Garza, Ph.D.	co-principal Investigator	40 hrs/mo, two weeks in summer, rest is leveraged.
Laura Good, Ph.D.	Education Liaison	20
Cheryl Logan, Ph.D.	CSUMB mentor	N/A, not budgeted under the award
Alison Haupt, Ph.D.	CSUMB mentor	N/A, not budgeted under the award
James Lindholm, Ph.D.	CSUMB mentor	N/A, not budgeted under the award

John Goeltz, Ph.D.	CSUMB mentor	N/A, not budgeted under the award
Ivano Aiello, Ph.D.	Moss Landing mentor	N/A, not budgeted under the award
Tim Turner, Ph.D.	Principal Investigator	5
Paul Tchounwou, Ph.D.	Co-Principal Investigator	1
Paulette Bridges	Program Manager	24
Ibrahim Farah, Ph.D.	Co-Investigator	Funded during the summer months
Fenxiang Han, Ph.D.	Co-Investigator	Funded during the summer months
Ranjani Kulawardhana, Ph.D.	Co-Investigator	Funded during the summer months
Brent Thoma, Ph.D.	Co-Investigator	Funded during the summer months
Carlos Cintra, Ph.D.	Co-Investigator	50
Owen Temby, Ph.D.	Co-Investigator	50
Erin Easton Ph.D.	Postdoctoral Research Associate	50
David Hicks Ph.D.	Principal Investigator	50
John Breier Ph.D.	Co-Investigator	Leveraged, not budgeted during time frame
Alejandro Fierro Ph.D.	Co-Investigator	50
Leticia Contreras	Education Liaison	64

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

What other organizations have been involved as partners?

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

Have other collaborators or contacts been involved? Yes

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

Cities of New Smyrna Beach, Edgewater, Oakhill, and South Daytona	J. Cho CCME B-CU	Collaborators and external partners on funded projects	Providing their properties (e.g. waterfront parks) for research, assist with outreach of the projects/workshops by CCME students
Ginger Adair, Volusia County Environmental Management	J. Cho CCME B-CU	Collaborators and external partners on funded projects	Providing in-kind fund and cash matches for projects by CCME students
Marine Discovery Center, Environmental Discovery Centers, and Marine Science Center	J. Cho CCME B-CU	Public education and outreach partners	Providing platforms for student engagement with the communities
Project H2O and Riverside Conservancy	J. Cho CCME B-CU	NGO consortia of varying organizations from local universities, governments, resource managers, public education, K-12 education	Providing volunteering hours/students
Annie Roddenberry, Florida Fish and Wildlife Conservation Commission (FWC)	J. Cho CCME B-CU	Collaborators and external partners on funded projects	Providing in-kind hours and boat times for projects by CCME students

Have NOAA collaborators or contacts been involved? Yes

NOAA Collaborator/Office/Program	CCME Faculty/Student Partner(s)	Description of Collaboration
Andrew DeVogelaere, Ph.D.	Miya Pavlock-McAuliffe	NERTO Mentor
Andrew DeVogelaere, Ph.D.	Lauren Parker	NERTO Mentor
Charles Wahle, Ph.D.	Taylor Eddy	NERTO Mentor
Michelle Johnston, Ph.D./ National Ocean Service/ Office of National Marine Sanctuaries: Flower Garden Banks National Marine Sanctuary	David Hicks, Ph.D./ Graduate Student Rebekah Hernandez	NERTO internship mentor
Scott Large, Ph.D./ National Marine Fisheries Service/ Fisheries Service Northeast Fisheries Science Center	Owen Temby Ph.D./ Graduate Student Anthony Lima	NERTO internship mentor
Kim Penn/ National Ocean Service/ Office for Coastal Management	Owen Temby Ph.D./ Graduate Student Cristina Madrid	NERTO internship mentor
Christopher Kelble, Ph.D.	J. Cho/Philip Bellamy	NERTO internship mentor/thesis committee
Gregory Dusek, Ph.D.	Craig Tinus/Shan Guruvadoo	NERTO internship mentor/thesis committee
Bill Arnold, Ph.D.	J. Cho/Mallory Brooks	NERTO internship mentor
Cheryl Woodley, Ph.D.	Michael Martinez-	NERTO internship

	Colon/Grad Student Angelique Rosa-Marin	mentor
Cheryl Woodley, Ph.D.	Michael Martinez-Colon/Grad Student Margarette Bayron-Arcelay	NERTO internship mentor

CCME Community Stakeholder Advisory Board Members

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

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

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

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

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

V. Impacts of Award

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

A total of 69 students have been recruited to join NOAA CCME in a variety of disciplines including environmental science, technology, and policy, ocean, coastal and earth science, marine sciences, civil and environmental engineering, biology, computer science, and social sciences.

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

The impact on candidate development is tracked and measured through the Individual Student Development Plan. Individual Student Development Plans were assessed with CCME Scholars at the end of the Spring 2018 semester (May, 2018).

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

During the current reporting period the Center hired a Distinguished Research Scientist as part of the award.

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?

Qualified applicants for the Data Communication and Information Manager are currently in review. The communication and data management duties of the Data, Information, and Communication Manager are currently being fulfilled by a coordinator (supported by university funds) assigned to NOAA CCME. Center Management (NOAA CCME Education Lead, Associate and Assistant Directors) also supports this function. NOAA CCME team members utilize sophisticated tracking tools to support data collection in keeping with the implementation of the award. Center Management and Institutional PIs also work closely with our external evaluator for quality assessment and quality control of more extensive data points associated with award activities to track how we are meeting our goals and objectives.

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

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

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

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

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

VI. Changes / Challenges

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

Actual or anticipated problems or delays and actions or plans to resolve them:
No anticipated delays anticipated at this time.

Changes that have a significant impact on expenditures:
No changes with significant impact on expenditures anticipated at this time.

VII. Special Award Conditions

I. EPP/MSI CSC Performance Progress Reports

NOAA CCME has complied with the requirement that Performance Progress Reports will be provided no later than 30 days following the end of each 6-month period from the start date of the original award. The original submission of the current report occurred on September 28, 2018 in compliance with the special award conditions.

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

III. Required Center Implementation Plan

The Center Implementation Plan was submitted on March 16, 2017 and has since been reviewed. An Implementation Plan Addendum was submitted to Grants Online (File ID: 2676722) on June 30, 2017 to address further suggestions from EPP. During the reporting period an additional revised Implementation Plan that included the addendum was submitted to Grants Online (File ID: 2650452) was submitted on June 15, 2018.

IV. EPP/MSI CSC Substantial Involvement and Collaborative Engagement

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

During the reporting period

Frequent engagement with NOAA EPP management team with communication and collaboration as NOAA CCME set up the Center under the FY16 NOAA award requirements. The EPP Supervisor Ms. Jacqueline Rousseau, EPP CSCs Program Manager Dr. Audrey Trotman, and co-Technical Monitors Dr. Steve Thur (NOS) and Dr. Chris Moses (OAR) participate in monthly NOAA CCME calls with the NOAA CCME Center Management Team and Co-PIs to discuss progress updates and upcoming events. The NOAA CCME Associate and Assistant Directors also meet with EPP each week via teleconference to further discuss progress towards award objectives. The co-Technical Monitors also engaged with NOAA CCME Scholars during the Capitol Hill Ocean Week (CHOW) held from June 5-7, 2018.

Participant Beneficiaries

Direct Student Support Table

Post-Doctoral Program -

NOAA CCME Postdoctoral Research Associate Dr. Emily Jones joined the team during the reporting period (July 2018) and has joined the CCME Coastal Intelligence group.

NERTO and Student Internships with NOAA

NERTO summary table

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

For the current reporting period the Center External Evaluator has received $25,000 in support.

VII. NOAA Environmental Data and Information

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

VIII. New Award Special Award Condition

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

IX. Multi-Year Special Award Condition

NOAA CCME recognizes that continued funding of the current award is contingent upon availability of funds. The funding period for this award is 09/01/2016 – 08/31/2019 and may be extended through 08/31/2021.

X. EPP MSI CSC Programmatic Special Award Conditions

CSC Programmatic Special Award Conditions

NOAA CCME Semi Annual Performance Report
(March 1 - August 31, 2018)
Larry Robinson, Principal Investigator and Center Director

A. Provide FY16 Center award information for:

1. **Total Number of EPP-funded post-secondary students from underrepresented minority communities** who are trained 61 and graduate 4 in NOAA-mission sciences.
2. **Total number of EPP-funded post-secondary students** who are trained 69 and graduate 5 in NOAA-mission fields relevant to this announcement.

3. **Number of EPP-funded graduates who enter the NOAA mission workforce as hires** by NOAA 0, NOAA contractors 0, NOAA partners 0, resource management agencies 1, NGO community 0, academia 0 or as entrepreneurs 0.
4. **Number of EPP-funded graduates who participate in and complete NOAA agency mission-related postdoctoral level programs** 0.

In Year 3 CCME plans to recruit nine transfer, 18 Master's, and two PhD students.

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

Total leveraged funding for reporting period: $669,336

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

Please see Executive summary and Products of Award.

5.1 Education and Training

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

Outputs

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

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

Outputs

- The number of degrees earned annually in NOAA mission-related disciplines.
- The number of students (total and URM) who participated in professional development opportunities, to include at least one on-site experiential research and training opportunity at a NOAA lab, office, or facility with tangible training and research: (a) for a minimum duration of 4 consecutive weeks, and (b) resulted in a publication or an oral or poster presentation to experts, peers, and/or other stakeholders.

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

Outputs

- Number of seminars, new courses, new programs, and new degrees offered to develop working skills and functional competencies to support the NOAA mission and workforce.
- Total numbers of students supported by the CSCs and degrees awarded that reflect the changing demographics of the nation (Census Bureau 2014 National Projections, http://go.usa.gov/c2VfP).

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

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

5.2 Scientific Research
Outcome 1. Increased NOAA mission-relevant research capacity at MSIs.
Outputs

- Number of research collaborations with NOAA and CSC faculty, staff and students.
- Number of NOAA scientists serving as mentors and advisors for student research.
- Number of intra-institutional collaborative partnerships established and maintained in support of NOAA's mission.
- Number of uses of NOAA data in research and tool development.
- Number of inter-institutional collaborative partnerships established and maintained in support of NOAA's mission.

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

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

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

- Amount of funds leveraged with CSC award to support NOAA mission in education and research.

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

- Number of structured activities to recruit and retain students, particularly from URM communities, in NOAA mission-relevant higher education programs.

- Number of MSI inter-institutional collaborative partnerships established and maintained in support of NOAA's mission.

Outcome 3. To increase communication of CSC accomplishments and capacity
Outputs
- Number of CSC products used by stakeholders.
- Number of featured articles in print or digital media referencing the NOAA CSC.

Outcome 4. Increased use of post-secondary education evaluation methodologies
Outputs
- Number of best practices that are measurable, scalable and transferrable.
- Consistent use of established evaluation practices, including higher education practices, to measure effectiveness of each component of the award.

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

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

- Goal 2: Enhance the scientific understanding of human interactions with the coastal environment in support of NOAA's place-based management specifically as it relates to the response of coastal and marine ecosystems to natural and human induced stressors;

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

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

Current tools in development:

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

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

NOAA CCME Distinguished Research Scientist Dr. Steve Morey, and collaborators are developing new global coastal upwelling index databases from satellite-derived winds. This is

on-going NASA-funded work, and website is functional now (http://coaps.fsu.edu/products-services/data/upwelling), but will be updated with ongoing modifications. I will also be working on new methodologies for upwelling indices (using multiple variables), and these data products will be served through the website as they are developed.

Appendix A: Science Advisory Council Members

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
pinckney@sc.edu; Phone: 803-777-5288

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

Council Members

Lisa Gonzalez, President and Chief Executive Officer
Houston Advanced Research Center (HARC)
lgonzalez@HARCresearch.org; Phone: (281) 364-6044

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

Jenn Eckerle, Deputy Director, Ocean Protection Council
jenn.eckerle@resources.ca.gov; Phone: (916) 654-9055

Jenn Eckerle joined OPC in December 2016. As OPC's Deputy Director, she is responsible for supervising staff and helping set the strategic priorities for coast and ocean policy in California. Before joining OPC, Jenn spent eight years as an ocean policy analyst for the Natural Resources

Defense Council, where she conducted technical analysis and developed policy recommendations to advance ocean conservation. Prior to that, she was a coastal program analyst for the California Coastal Commission and the San Francisco Bay Conservation and Development Commission. Jenn earned an M.S. in Marine Biology from the Florida Institute of Technology and a B.S. in Biology from the University of Vermont.

Dr. Brean Duncan, Ecological Program Integrated Mission Support Services,
brean.w.duncan@nasa.gov; Phone: 321-861-6292

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.

Dr. Philip Kramer, Director, Florida Institute of Oceanography,
philipkramer@usf.edu; Phone: 727-553-1100

Philip Kramer joined the Florida Institute of Oceanography as the director in August, 2016. Previously, Phil spent 13 years with The Nature Conservancy (TNC) as a senior scientist initiating and advancing marine conservation efforts in Florida and internationally in more than a dozen countries around the world.

Trained as a tropical marine geologist with a Ph.D. from the University of Miami's Rosenstiel School of Marine and Atmospheric Science, Phil has spent much of his career advancing tropical ecosystem monitoring, management, and restoration of coral reefs and mangroves. He is the co-founder of the Atlantic and Gulf Rapid Reef Assessment Program (AGRRA), which is a widely accepted as the standard scientific monitoring protocol for reefs and currently houses one of the largest databases on coral reef condition (www.agrra.org). He also established the Florida Reef Resilience Program (FRRP) disturbance response monitoring program which continues to collect annual data on the condition of corals during summer bleaching events (www.frrp.org).

NOAA Employee Members

Dr. LaToya Myles, Deputy Director, NOAA Air Resources Laboratory, Atmospheric Turbulence and Diffusion Division, Oak Ridge, TN,
latoya.myles@noaa.gov; Phone: 865-220-1729

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

Dr. Charles Wahle, Senior Scientist, NOAA National Marine Protected Areas Center, Charles.Wahle@noaa.gov; Phone: (831) 645-2703

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

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