



Dr. Paulinus Chigbu  
LMRCS Director

## *To The LMRCS Community*

It is with great pleasure that I welcome you with the summer 2019 edition of the LMRCS's (Living Marine Resources Cooperative Science Center's) newsletter, *The Living Sea*. In the newsletter, you will see the LMRCS has been growing and is making new strides in the marine sciences.

Highlighted in this edition are the budding scientists that the center has graduated over the past fall and spring semesters — 11 to be exact! Also, we have featured some of our students and their exceptional research, in addition to showcasing the 2019 Cohort Experience Workshop. At the week-long academic workshop, LMRCS students came from across the country to enhance their knowledge of fisheries and aquatic sciences, in addition to networking and creating professional relationships with fellow students, NOAA scientists and faculty.

As you take the time to review our center's highlights, you will see the many initiatives the LMRCS has facilitated, and with that, we hope to have your continued support as we continue our most valuable work of training the next generation of marine scientists!

*Paulinus Chigbu*, Ph.D.

LMRCS Director

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## *LMRCSC Graduates*

Congrats are in order for a number of LMRCSC students! In December of 2018 and May of 2019, some of the Center's brightest and finest earned their graduate and undergraduate degrees.

Our most recent graduates are:



Brian Galvez, in May 2019, graduated with his MS degree in Natural Resources and Fisheries from Delaware State University.

Mr. Galvez has secured a Conservation Project Reviewer position with the Delaware Department of Natural Resources and Environmental Control's Division of Fish and Wildlife.



Stephanie Martinez-Rivera graduated with her Ph.D. in Marine Estuarine and Environmental Science from the University of Maryland Eastern Shore in December 2018. Currently, Dr. Martinez-Rivera is publishing her dissertation research.



Andre Price earned his MS degree in Marine Estuarine and Environmental Science from the University of Maryland Eastern Shore in May 2019. Andre has accepted a position and is working as an Aquarist for NOAA Northeast Fishery Center in Woods Hole, MA.



Rebecca Wenker graduated in May 2019 with a MS degree in Marine Estuarine and Environmental Science from the University of Maryland Eastern Shore in May 2019. Currently, Rebecca is a contractor for diving support services at UMES.



Cara Schweitzer graduated from the University of Maryland Eastern Shore in May 2019. Dr. Schweitzer earned her doctorate degree in Marine Estuarine and Environmental Science. She is currently a research post-doctoral fellow at Hampton University.



Jorge Rodriguez earned his Ph.D. in Marine Estuarine and Environmental Science from the University of Maryland Eastern Shore in May 2019. Dr. Rodriguez has begun working as a Biologist for the Food and Drug Administration in Rockville, Md.



Nefertiti Smith graduated in May 2019 with her bachelor's degree in Marine and Environmental Science from Hampton University. Ms. Smith will continue her education and pursue her Ph.D. in Evolutionary Biology at the University of California, Irvine in fall 2019.



Kendra Dorsey graduated with a bachelor's degree in Marine and Environmental Science in May 2019 from Hampton University. Ms. Dorsey will continue her academic career in fall 2019 at the University of Michigan to pursue her Master of Science degree in Environmental Science.



Nakia Coit graduated in May 2019 with her bachelor's degree in Agriculture, with a concentration in animal science, from the University of Maryland Eastern Shore. She plans to attend veterinary school at Tuskegee University.



In May 2019, Malisa Smith graduated with her bachelor's degree in Biology from the University of Maryland Eastern Shore.

Dante Freeman graduated with his Bachelor's degree in Marine Science from Savannah State University in May 2019.

Congratulations to all of the graduates!

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## *2019 NOAA LMRCS C Cohort Experience*



The annual NOAA Living Marine Resources Cooperative Science Center (LMRCSC) Spring Cohort Experience took place in April 2019 and the workshop was a success! The administrators of the LMRCS C created an annual workshop to ensure that graduates from the center understand the fundamentals of the NOAA Fisheries related sciences. Thirteen graduate students from six partner institutions came together and

honed their skills on marine and fisheries science, in addition to building professional relationships with NOAA scientists, LMRCS C faculty and fellow students, alike.

The cohort workshop provided students with lectures and enrichment activities presented by LMRCS C faculty and NOAA fisheries scientists. Some of the topics discussed included sustainable aquaculture, stock assessment and ecosystem-based fisheries management. Grant writing and the human dimension aspect of fisheries were discussed as well.

Not only did students collaborate in the classroom setting; however, field experience was also a part of the agenda. The cohort of students took a trip to Deal Island, Maryland where Chris Daniels, the boat captain for the LMRCS C, provided teachings on fisheries from the perspective of watermen.



In addition to faculty and scientists providing talks on fisheries, there were some other special guests also in attendance. NOAA research scientist, Dr. Chris Harvey from NWFSC Seattle, WA spoke to students about ecosystem science. Also, NOAA research scientist, and LMRCS C graduate, Dr. Larry Alade from NEFSC Woods Hole, MA gave a lecture on fish stock assessment.

Students expressed that the workshop was informative and a great help to their studies. Multiple attendants spoke of how the sessions and lectures would aid them in their academic and professional careers. Some student reviews include the following:

*“This cohort experience has provided a foundation of support to my career. The connections, conversations and knowledge gained here will lead to collaborations and have strengthened the quality and impact of my research.”*

**-Amanda Pappas, NOAA EPP LMRCSC M.S. student**

Delaware State University

*“It was a fantastic opportunity to meet other students that may become colleagues in the future. The workshops provided a glimpse of some of the important work NOAA does which was helpful to understand my own career interests.”*

**-Nicole Kleponis, NOAA EPP LMRCSC M.S. student**

Delaware State University

*“The cohort experience exposed me to other areas of marine science from which I can bring collaborations to help design a more dynamic and impactful research study.”*

**-Anonymous**

University of Maryland Center for Environmental Science

*“It has opened communication with many resources (faculty and students), clarified all that LMRCSC has to offer while I am matriculating. It also helped me realize what I don’t want to do, and the areas I’m most interested in pursuing post my doctorate. The skills in most of the workshops were very useful to me, and there was so much information to digest.”*

**-Anya Byrd, NOAA EPP LMRCSC Ph.D. student**

University of Maryland Center for Environmental Science - IMET

*“This program was my first physical interaction with the greater LMRCSC participants and helped me understand, or rather clarify, the amount of great work being done with this program. This workshop has fostered collaboration and networking that will potentially continue for the rest of my scientific career.”*

**-Benjamin Alexander Frey, NOAA EPP LMRCSC M.S. student**

University of Maryland Center for Environmental Science - Chesapeake Biological Laboratory

*“The experience allowed me to build relationships with other budding marine scientists that will become valuable as we progress through our careers. I have a better academic understanding of the breadth of science conducted at NOAA and how my research fits in the big picture. I understand better the breadth of science included in the field of human dimensions and how I can think about incorporating social science with my research.”*

**-Matthew Ramirez, NOAA EPP LMRCSC Ph.D. student**

Oregon State University

*“Building connections with other students in the cohort was so helpful in understanding the breadth of this program and developing connections for future collaborations. Experiencing the diversity and passion of my peers across the country was inspiring and motivates me in my future pursuits in my graduate degree and career. NOAA LMRCSC workshop was also helpful in expanding my understanding of the human dimensions of marine science.”*

**-Hillary Thalmann, NOAA EPP LMRCSC M.S. student**  
Oregon State University

*“This experience has given me the opportunity to get to know my cohort, which will one day be future colleagues! I have made contacts here that will foster into professional collaboration.”*

**-Keala Pelekai, NOAA EPP LMRCSC M.S. student**  
Oregon State University

*“The cohort experience has helped me to better determine where I may fit as a scientist at NOAA. The workshop has also provided me with awesome tools that has already helped to build my confidence in public speaking and presentations. Being a part of this workshop and realizing my role in NOAA’s mission has provided me with a sense of pride. I look forward to using the knowledge and connections I have made at this workshop to improve my projects, collaborations and chances to have a career at NOAA.”*

**-Shanelle Haughton, NOAA EPP LMRCSC Ph.D. student**  
University of Maryland Eastern Shore

*“The cohort experience has brought me closer to people that share similar passions in Marine Sciences. I’m happy to say that Social Science is a real science. Before I thought little of the social science field but now I don’t see how science could be done without it! I’m glad to be a part of something that supports, pushes, and guides me to new challenges. Thank you for the fun time!”*

**-Shaneese Mackey, NOAA EPP LMRCSC M.S. student**  
Savannah State University

*“The cohort experience has aided me by allowing me to participate in various professional development training classes. Through the cohort experience, I was able to learn valuable skills that I may have not received as just a regular graduate student. I was able to network and connect with professionals from different parts of the country, as well as interact with fellow LMRCSC students.”*

**-Davielle Drayton, NOAA EPP LMRCSC M.S. student**  
Savannah State University

*“A week long, graduate level sharpening will always be the quickest way to transform knowledge into the genetic makeup of graduate students. Older people often get stuck in their ways, but these eager students are sponges for knowledge. I was simply a student out of place “LSAMP,” that played the roles of water in its solid state and become less dense, thus allowing myself to expand and grab knowledge from statisticians to molecular biologists. I maintained the ability to stay afloat and never drowned in this pool of knowledge—I swam. Because of this I will be a great scientist.”*

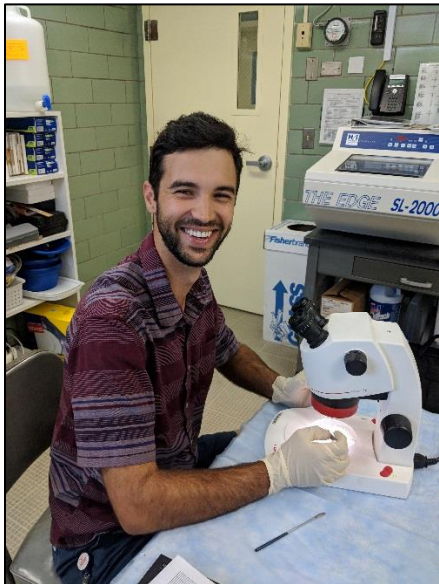
**-Reuel Danquah, LSAMP Bridge to Doctoral Degree, M.S. student**  
University of Maryland Eastern Shore

The NOAA LMRCSC continues to provide a more enriching experience for its students. Through classroom settings, to hands on experiences, we continue to prepare our students to be great scientists.

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## *Student Spotlights...*

### *Galvez’s Research Sheds New Light on the Feeding Habits of Weakfish*



Delaware State University graduate, Brian Galvez, supported by the NOAA Living Marine Resources Cooperative Science Center, is well on his way to making tremendous strides in the fisheries field. The budding scientist — who graduated in May 2019 — successfully defended his thesis based on his research on weakfish. The research project, entitled “Trophic Ecology of Juvenile Weakfish from the Delaware Bay Using Stomach Content and Stable Isotope Analyses,” provided new insights into the feeding habits of the species.

Galvez’s work consisted of observing juvenile weakfish and their diet. Brian’s observation took place from May 2017 to October 2018.

“My observation locations spanned from the mouth of the Delaware Bay to the Delaware River,” stated Galvez. “I also observed both sides of the Delaware Bay simultaneously, which is the first time that has been done with juvenile weakfish in the bay.”

In the mid-1990s the juvenile weakfish began to dwindle in population size due to the fish being caught in large quantities. As a means to combat the decline, fishing quotas were put in place to cease overfishing; however, the population of the juvenile weakfish continued to decrease because of high natural mortality, the causes of which are still unknown to biologists.

Through Galvez's research, new observations were made. He discovered, by using both gut content and stable isotopes analyses, that Weakfish have a diet which is more dependent on amphipods than was previously reported.

"Journal articles in the past have stated that the mysid shrimp are the primary diet of the juvenile Weakfish; however, my research has shown that the fish have a diet that appears to be just as dependent on amphipods as they are on mysid shrimp," stated Galvez. "Besides my research, I have not come across any journal articles that speak to the importance of amphipods in the diet of juvenile Weakfish."

In addition to conducting research for his thesis, Brian's academic career also includes completing his NOAA Experiential Training Opportunity (NERTO) at the NOAA Cooperative Oxford Laboratory in Oxford, MD., where Dr. Howard Townsend served as his mentor. Also, in March of this year, Brian participated in the USDA Agricultural Research Director's Symposium that was held in Jacksonville, FL. There he took home the first place prize for "Best Oral Presentation for a Graduate Student."

With a resume that is already impressive, one may wonder how the budding scientist will best his already great accomplishments.

"Immediately after graduation I plan to stay in Delaware and gain a job in Fisheries," stated Galvez. "But ultimately, my goal is to work as a Fisheries Biologist for NOAA, or another organization in the state of Washington."

Understanding all that Brian has completed thus far, we are confident that he will continue to soar to greater heights!





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## *LaTreese Denson Makes Strides in Stock Assessment Research at the University of Miami*



Hailing from the borough of Brooklyn in the great state of New York, LaTreese Denson is a Ph.D. student at the University of Miami - RSMAS. Currently in the third year of her program, the upcoming scientist completed a NOAA Experiential Research and Training Opportunity, also known as a NERTO, in 2018.

Denson completed her NERTO at the NOAA Alaska Fisheries Science Center located in Seattle, Washington. It was there where she participated in a three-month internship, during which she was taught how to build spatial models focused on the King Mackerel population.

“Spatial models are algorithms that are created which allow for scientist to see where a specific species or animal migrates to,” stated Denson. “These algorithms that I used allowed for me to see

where the higher populations of King Mackerel fish were located.”

The spatial model that LaTreese used during her NERTO was created by her NOAA mentor, Dr. James Thorson. Dr. Thorson created the package entitled *VAST* which is used to run geospatial statistical models. The *VAST* package is now being used to support the management of many species across various management regions. The research results from LaTreese’s NERTO, and other spatial models, are used by Regional Fisheries Management Councils to manage fisheries.

Denson stated, “The Fisheries Council uses the data from spatial models to help determine quotas. Knowing the populations of various types of fish allows for the council to create quotas for recreational and commercial fishing.”

While at her NERTO, LaTreese also had the opportunity to present a talk on stock assessments at the University of Washington. In addition, she presented and proposed ideas on the topic of spatial distribution at a meeting held by the International Council for Exploration of the Sea in Hamburg, Germany.

The LMRCS is confident that Ms. Denson will do nothing less than excel in her budding career!



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## *Dr. Rodriguez Successfully Studied the Interactions of Blue Mussels with their Parasites*



Environmental Molecular Biology and Biotechnology can seem like an intimidating field; however, NOAA LMRCS graduate, Jorge Rodriguez, was not only up for the challenge, he is well on his way to succeeding in the field.

Earning his PhD. in May 2019 from the University of Maryland Eastern Shore, Jorge proved himself to be an outstanding student, and soon to be scientist. During the summer of 2018, Jorge completed his NOAA Experiential Research and Training Opportunity (NERTO) at the NOAA Northeast Fisheries Science Center lab in Milford, CT. While under the supervision of Dr. April Croxton and Dr. Gary Wikfors, Rodriguez gained training in flow cytometry, which is the method where cells, or biomolecules, are fluorescently tagged, allowing for them to be counted and have their level of fluorescence measured.

“This type of research allows scientists to see if cells are expressing any abnormal epitopes,” stated Jorge, who used the flow cytometry technique to study the interactions between blue mussels and their parasites. “It is used a lot in cancer research.”

In addition to a successful NERTO experience, this past April, Jorge defended his dissertation titled: “The Use of Glycan Epitopes to Characterize *Mytilus Edulis* Hemocytes and their Molecular Interactions with *Proctoeces maculatus* and *Himasthla quissetensis*.”

“Blue mussels are a large part of the aquaculture economy and scientists were seeing that a number of them were becoming infected by parasitic trematodes,” stated Jorge. “Some cases occurred whereby infected mussels were able to fight off the trematodes, thus recovering from the invasion of the parasite; however, there were other instances when the mussels would succumb to the infection and die.”

Scientists were unsure of why some mussels were able to clear themselves of the infection, while others fell to its demise. The parasitic trematodes were having adverse effects on the blue mussel population, thus affecting the number that could be captured by watermen for sale and consumption.

Jorge used flow cytometry during his research to assess if the cells in the mussels were expressing glycoproteins that may have been involved in the recognition of the parasites.

“My research showed that during a specific life stage of the blue mussel’s existence, a particular sugar is expressed by the parasitic trematode. During this time, the sugar is not found on the exterior portion of

the mussel's hemocytes. When this occurs, the hemocytes recognize the parasite as a threat, therefore an immune response takes place, causing the mussel to fight off the infection. However, when the sugar is not accessible to the hemocytes, there is no immune response," explained Rodriguez.

"However, during another one of the trematode's life stages, sugar is not found on the exterior of the parasite. When this happens, an immune response cannot occur, and the mussel is not able to ward off the infection."

Jorge's findings were groundbreaking in molecular biology and greatly contributed to knowledge of the mechanisms of interaction between bivalve mollusks and their trematode parasites.

Dr. Rodriguez plans to take his expertise and become a trailblazer in the public sector. Upon graduation, he will hold the title of "Biologist" as a new employee for the Food and Drug Administration in Rockville, MD. There, he will work with testing new prescription drugs before they go on the market.



We at the LMRCSC are confident that Jorge will do great things. Job well done!

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## *LMRCSC Funded TAB Projects*

The Living Marine Resources Cooperative Science Center funds a select number of collaborative projects each year after proposals from Center students and scientists have been reviewed by the Technical Advisory Board (TAB). Below are the TAB Research projects that were funded in the 2017-2018 Academic Year:

- a. Baseline data of male reproductive status for Jonah Crab management (**Sook Chung, IMET**; Bradley Stevens, UMES; Amanda Lawrence, M.S. student at IMET; Burton Shank, NOAA).
- b. Indices of abundance for King Mackerel in the Gulf of Mexico and South Atlantic improved by incorporating spatiotemporal and environmental variability (**LaTreese Denson, Ph.D. student, RSMAS**; Elizabeth Babcock, RSMAS; Dionne Hoskins-Brown, SSU; John Walter, NOAA; James Thorson, NOAA)
- c. Integration of habitat-specific growth variation into assessment models: a case study in the Kemp's ridley sea turtle (**Matthew Ramirez, Ph.D. student, OSU**; Selina Heppell, OSU; Elizabeth Babcock, RSMAS; Jeffrey Moore, NOAA; Larisa Avens, NOAA).
- d. Cold-water corals in the Mid-Atlantic Bight: age, colony complexity, and growth (**Rebecca Wenker, M.S. student, UMES**; Bradley Stevens, UMES; Vince Guida, NOAA).

- e. Assessing the impacts of harmful dinoflagellates and *Vibrio* spp. on oyster aquaculture in the Delaware Inland Bays (**Detbra Rosales, Ph.D. student, UMES**; Joseph Pitula, UMES; John Jacobs, NOAA)
  - f. Diet analysis of juvenile weakfish in the Delaware Bay using stomach content and stable isotope analysis (**Brian Galvez, M.S. student, DSU**; Stacy Smith, DSU; Maurice Crawford, UMES; Howard Townsend, NOAA)
  - g. Feeding ecology of Black Sea Bass at selected reef sites using gut content and stable isotope analyses (**Andre Price, M.S. student, UMES**; Bradley Stevens, UMES; Richard McBride, NOAA)
  - h. Underrepresentation in marine and fisheries science professions: how significant life experiences shape a diverse workforce (**Brittany King, Ph.D. student, OSU**; Kelly Biedenweg, OSU; Kevin Werner, NOAA; Suzanne Russell, NOAA)
  - i. Assessment of microplastics and polybrominated diphenyl ethers (PBDEs) in scallops as possible indicators of plastic pollution from the Georges Bank, Mid-Atlantic, Southern New England, and Gulf of Maine Stock Fisheries (**Enid Munoz, M.S. student, UMES**; Ali Ishaque, UMES; Ashok Deshpande, NOAA; Beth Sharack, NOAA)
  - j. Examining ecosystem health through contaminant analysis of common bottlenose dolphins (*Tursiops truncatus*) (**Tara Cox, SSU**; Carolina Bonin Lewallen, HU; Gina Ylitalo, NOAA).
  - k. Genetic-based methods for assessing prey composition and feeding ecology of Pacific lampreys (**Eric Lewallen, HU**; Carolina Bonin Lewallen, HU; Laurie Weitkamp, NOAA; Linda Park, NOAA).
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The Association for the Sciences of Limnology and Oceanography (ASLO) held its annual Aquatic Sciences Meeting in San Juan, Puerto Rico in February 2019. The meeting focused on many topics that were crucial to the area of Puerto Rico, such as clean water, environmental recovery, renewable energy and a host of other topics.

There were a number of LMRCSC faculty and staff members who were in attendance and provided talks on various subjects related to the marine sciences.

The following LMRCSC scientists and students presented their work:

- **Gibson, Deidre (HU):** UNDERREPRESENTED BUT NOT FORGOTTEN: THE MAKING OF A MARSHALL SCHOLAR
- **Galvez, Brian (DSU);** Smith, S.; Townsend, H.: TROPHIC ECOLOGY OF WEAKFISH (*CYNOSCION REGALIS*) FROM THE DELAWARE BAY USING STABLE ISOTOPE AND STOMACH CONTENT ANALYSES
- **Da Silva, L. (UMES);** Ossai, S.; Chigbu, P.; Parveen, S.: CHARACTERIZATION OF *VIBRIO VULNIFICUS* ISOLATED FROM ENVIRONMENTAL AND BLUE CRAB SAMPLES COLLECTED FROM MARYLAND COASTAL BAYS
- **Wenker, R. (UMES);** Stevens, B.: SEA WHIP CORAL (*LEPTOGORGIA VIRGULATA*) IN THE MID-ATLANTIC BIGHT: AGE, COLONY COMPLEXITY, AND DISTRIBUTION
- **Fitzenreiter, K. (UMES):** SURFACE CIRCULATION PATTERNS AND CURRENT VELOCITIES DERIVED FROM DRIFTERS IN COASTAL WATERS OF MARYLAND AND VIRGINIA (Katie Fitzenreiter served as Chair of the Physical Dynamics section at the ASLO 2019 meeting)
- **Morales-Nunez, A. (UMES);** Chigbu, P.: THE COMMUNITY STRUCTURE OF SOFT-BOTTOM MACROBENTHIC FAUNA IN DEAD-END CANALS IN THE MARYLAND COASTAL BAYS, USA
- **Ishaque, A. (UMES);** Elfadul, R.; Jesien, R.; Elnabawi, A.; Chigbu, P.: ANALYSIS OF EMERGING CONTAMINANTS IN MARYLAND COASTAL BAYS USING IN VITRO BIOASSAYS AS BIOLOGICAL SCREENING TOOLS
- **Layton, J. (HU):** THE FEEDING ECOLOGY OF PACIFIC LAMPREYS ASSESSED BY GUT FULLNESS AND PREY IDENTIFICATION

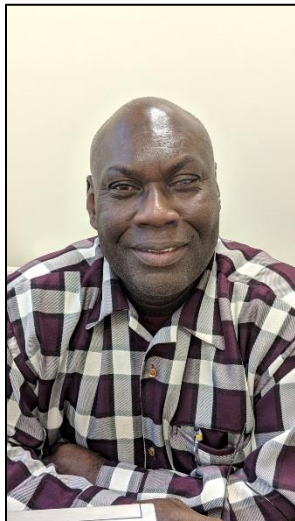
- **Rubalcava, K. (UMES);** Chigbu, P.: RECRUITMENT AND DENSITY-DEPENDENT GROWTH OF SPOT (*LEIOSTOMUS XANTHURUS*) IN THE MARYLAND COASTAL BAYS
- **Das, N. (UMES);** Mayor, E.; Chigbu, P.: POPULATION DYNAMICS OF BLUE CRABS IN THE MARYLAND COASTAL BAYS (\*Das was an REU intern at UMES in 2018)
- **Freeman, D. (SSU);** Deshpande, A.; Lynch, J.; Lascelles, N.; Drayton, D.; Brignac, K.; Jung, M.; Hoskins-Brown, D.: COMPARING 2 METHODS TO CHARACTERIZE THE CHEMICAL COMPONENTS OF MARINE PLASTIC DEBRIS

Job well done to all of the presenters!

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## *Welcome New Team Members!!!*

Congratulations are in order! In November 2018, Alex Kessie and Tanesha Hankerson became the newest members of the LMRCSC team!



Mr. Alexander Kessie is the Coordinator for Budget and Data Management for the LMRCSC. His primary duties include managing the finances and the funding for the Center. Alex also has secondary duties, which include assisting in the development and management of the LMRCSC website.

Prior to his position at UMES, Mr. Kessie served 13 years at Jackson State University, in Jackson, MS., where he held the title of IT manager for the Environmental Science PhD Program, in addition to serving as Webmaster for the College of Science, Engineering and Technology. He later joined the Research Center for Minority Institutions (RCMI) – Center for Environmental Health, where he served as the Program Manager for a year and a half.

Mr. Kessie received his MM degree in Management from Limburg University, Diepenbeek in Belgium and his MS degree in Computer Science from Jackson State University in Jackson, MS.

Ms. Tanesha Hankerson was hired as the Communications and Outreach Specialist for the LMRCSC. Her duties include, updating the LMRCSC website, management of the center's social media channels and producing communication materials that aid the Center in meeting its outreach goals.



Ms. Hankerson has a background in communications which includes working for various industries such as emergency management and media relations. Prior to her time at UMES, Tanesha served as the Community Liaison for District 1 of the Maryland State Highway Administration. There she handled communications efforts with the media and surrounding communities.

Ms. Hankerson received her MA degree in Communications from Trinity Washington University in Washington, D.C. and her BA degree in English from the University of Maryland Baltimore County.

