Morgan State University
Patuxent Environmental and Aquatic Research Laboratory

The Morgan PEARL

Director's Corner

Spring is a season of anticipation and preparation at the PEARL. The emergence of the Coronavirus Disease (COVID-19) pandemic puts a dark and distressing twist on this theme. All laboratory employees who can work remotely are now doing so, and I write this note on March 19 from the PEARL lab with only myself and Facilities Manager Jon Farrington on-site. Preparations are now on hold for our Summer 2020 undergraduate student intern program, with this summer's program now very much in doubt. A total of 27 applications had been received from South Korea, Scotland, the U.S. Virgin Islands, and several U.S. states. We anticipated hosting seven highly talented interns who would have supported research projects spanning a wide range of topical areas, including oyster biodeposit resuspension, recreational boating economics, and oyster genomics. Spring is also spawning season in the PEARL oyster hatchery. Dr. Ming Liu has plans to produce a new and improved oyster line, continuing his progress in developing a superior oyster that is well-suited for survival and growth in Maryland waters. Currently, we are optimistic that this work can continue with a limited staff, though the ever-evolving COVID-19 situation means that the timeline for this work may need to be extended.

On a more uplifting note, PEARL is very excited to welcome the arrival of our new oyster hatchery manager and shellfish extension specialist — Ms. Brittany Wolfe. Ms. Wolfe comes to the PEARL after completing her Master's degree in Marine Biology at the University of North Carolina—Wilmington (UNCW), where she worked as a research technician in the UNCW shellfish hatchery. An added benefit is that Ms. Wolfe is well-versed in oyster genomics research—both through her Master's thesis at UNCW and previous employment at the Virginia Institute of Marine Science. This experience should pay great dividends as she supports Dr. Liu in his genomics research.

Another exciting development is the hiring of Dr. Amanda Knobloch, PEARL's new Education Coordinator. Dr. Knobloch, who replaces long-term employee Richard Lacouture (since 1984!), brings a fresh perspective, a biogeochemist's background, and a passion for making chemistry fun and exciting. Dr. Knobloch is also working on developing an innovative, interdisciplinary academic program at the PEARL to better connect PEARL to the undergraduate academic framework at Morgan.

I hope you will enjoy the Spring 2020 PEARL newsletter - perhaps it will offer a brief respite from the challenges we are facing. Please stay safe and well during this difficult time. Thank you for reading and for your interest in and support of the Morgan State University PEARL.

Best Regards,

Scott Knoche

Scott Knoche, Ph.D.
scott.knoche@morgan.edu
Director, PEARL

Vision Statement

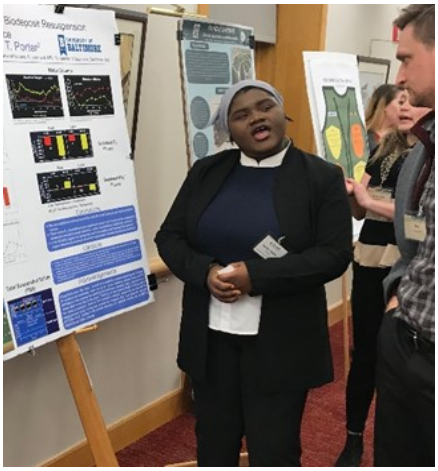
An environmental research laboratory that:

- *generates scientific knowledge through innovative, interdisciplinary environmental research;*
- *embraces a public university's role in translating this knowledge to stakeholders for the benefit of the public; and*
- *inspires the next generation of scientists, policy-makers and environmentally-aware citizens through coastal field experiences, mentored research opportunities, and environmental education.*

PEARL Interns Present Research at Conferences

Annual Biomedical Research Conference for Minority Students (ABRCMS)

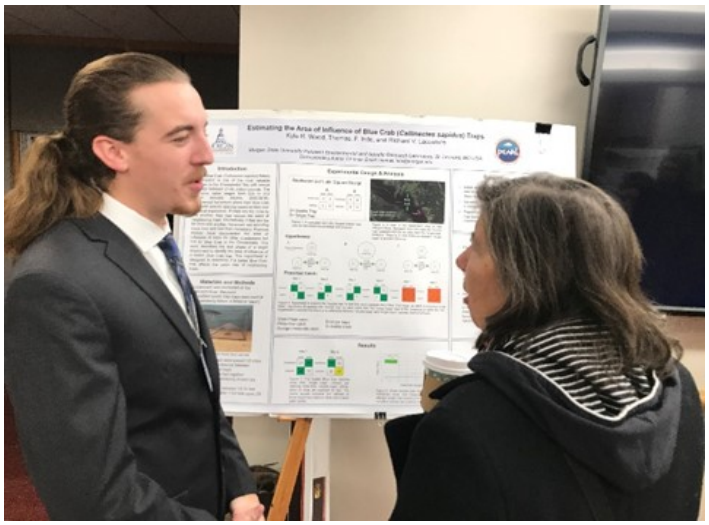
Morgan State University students Maya Purnell and Kojo Yeboah, both 2019 PEARL summer interns, attended the ABRCMS held in Anaheim, California. They presented their research "Identifying Low Salinity Eastern Oysters (*Crassostrea virginica*) to Develop a Superior Oyster Line" and "Identification of Osmoregulatory Candidate Genes Responding to Low Salinity in Eastern Oysters" at the conference. ABRCMS is one of the largest communities of underrepresented minorities in science, technology, engineering and mathematics. The conference was held from November 13-16, 2019, with more than 2,500 students from over 350 colleges and universities participating.



MSU senior Ms. Habibah Oladosu answers questions about her PEARL research on the effects of oyster waste.

Chesapeake Watershed Forum

Six PEARL summer undergraduate interns received all-expenses-paid scholarships for themselves and their faculty mentors to attend the a 3-day Chesapeake Watershed Forum, held November 15-17, 2019 at the National Conservation Training Center, in Shepherdstown, WV. Organized by the Alliance for the Chesapeake Bay, the conference was an exciting opportunity for these students to gain professional experience developing and presenting a poster describing each of their research projects, and to attend workshops focused on Chesapeake Bay environmental research. Selection for the conference was competitive based on abstract submissions, and Morgan State University was well-represented with posters presented by MSU seniors Victoria Agboola, and Habibah Oladosu, as well as MSU-PEARL staff Kyle Wood. Of the four awards given amongst the 60+ competitors, PEARL intern Caroline Troy won in the category of "Peoples' Choice" for the best poster presentation! Congratulations to all MSU-PEARL competing undergraduates. Well done!



MSU-PEARL technician and College of Southern Maryland senior Mr. Kyle Wood presents his PEARL blue crab research.

MSU senior Ms. Victoria Agboola stands ready to tell others about her oyster research performed in a river near PEARL.

Environmental Economics Research

The PEARL is a partner in a multi-state consortium that was awarded a $1.2 million grant to study how to grow Atlantic salmon in land-based aquaculture systems. This competitive grant comes from the National Sea Grant Office, part of the National Oceanic and Atmospheric Administration. The PEARL economics team will be conducting an economic and feasibility analysis of Atlantic salmon in recirculating aquaculture systems. In December, Dr. Scott Knoche and Ms. Kaitlynn Ritchie attended a kickoff workshop held in Bayfield, Wisconsin, meeting with project collaborators and aquaculture industry partners to discuss the current status and prospects of the domestic salmon industry.

The PEARL economics team has recently completed a project with the Maryland Port Administration examining the economic benefits from the Physical Oceanographic Real-Time System (PORTS), a Chesapeake Bay navigational system administered by NOAA. The study found that data available from PORTS enables larger cargo vessels to navigate the Bay. Economic benefits related to cargo maximization and delay reduction are estimated to be $3.3 million annually.

PEARL Research Featured in Bay Journal Article

Recent PEARL research designed to improve efficiency in crab harvest and save watermen money is featured in a new *Bay Journal* article. The article can be viewed online at:
https://www.bayjournal.com/article/results_of_crab_pot_placement_research_too_close_to_call_it_either_way

A video interview about the research can be viewed at:
https://www.youtube.com/watch?v=2DFFUeXTJBo&feature=emb_logo

Kyle Wood, Sr. Research Technician at PEARL (photo credit-Jeremy Cox)

Inside the Aquaculture Program

Dr. Liu joins newly formed USDA Multistate Coordinating Committee

Dr. Ming Liu joined a newly-founded USDA Multistate Coordinating Committee NECC1901-"Integrating Genomics and Breeding for Improved Aquaculture Production of Molluscan Shellfish". The objectives of the committee are to provide a forum for shellfish breeders, geneticists, physiologists, and industry members to discuss ways of capitalizing on state of the art genomic tools in shellfish breeding programs, provide a setting where committee participants can identify key targets of selection, and assess how to design selection programs to bring about improvement for those traits. The committee also strives to identify research needs for the sustainable enhancement of shellfish production (particularly with respect to emerging issues such as ocean acidification, climate change, and new pathogens), develop strategies to involve industry partners in genetic research, coordinate research efforts among researchers along the East, Gulf, and Pacific Coasts, and provide industry partners with current information about ongoing research concerning shellfish production and the development of shellfish stocks with improved yields. The annual meeting will consist of research updates from committee participants and roundtable discussions of progress in integrating genomic techniques into shellfish breeding programs, industry needs, and emerging issues. These meetings will be scheduled in conjunction with major conferences that bring research and industry partners together in order to maximize attendance and minimize costs.

Chinese Natural Resources Delegation visits PEARL

PEARL hosted a Chinese Natural Resources Delegation from Zhejiang Province on Dec 18th, 2019. The delegation works on the Thousand Islands Lake and Xin An River Basin Water Resources and Ecological Environment Protection Program. The delegation visited to discuss potential ecological protection of the ocean and water resources. Dr. Knoche gave an introduction to current PEARL research, including projects focused on water resources protection and restoration efforts of the Chesapeake Bay.

Chinese Natural Resources Delegation at PEARL

PEARL Collaborations

PEARL will be hosting a visiting scholar, Dr. Shengyong Xu from from Zhejiang Ocean University of China in 2020. Dr. Xu's research area is population genetics and genomics of marine fish. In the previous three years, he performed studies on population genetic structures and genomic adaptive evolution of several economically important fish species in Northwestern Pacific, such as *Sebastiscus marmoratus,* Japanese whiting *Sillago japonica*, and Japanese sand lance *Ammodytes personatus* through genomics sequencing, and published 10 peer-reviewed papers on several influential journals in the genomics area such as GigaScience, Scientific Data and Scientific Reports.

PEARL Facilities News

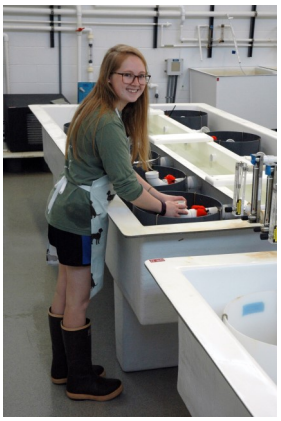
Here in the PEARL Facilities Department, we're making preparations to support the "spring blossoming" of several of our warm-weather research programs. Within our wet laboratories, we're preparing our large-capacity culture tanks and new LED lighting technology to support Morgan professor Dr. Viji Sitther and postdoctoral research associate Dr. Ben Tabatabai as they increase the scale of production in their cultures of halotolerant cyano-bacteria. Additionally, we're developing a new apparatus to assist our long-time visiting researcher Dr. Elka Porter with another season of her outdoor STURM experiment exploring oyster biodeposit resuspension. Arguably, the capstone of this summer's research activity will occur within our Oyster Hatchery, where we are busily rearranging, repairing, and renewing our hatchery equipment and seawater system to support Dr. Ming Liu with his oyster genomics research (with the assistance of our brand-new Hatchery Manager, Brittany Wolfe - welcome aboard Brittany!). Last but not least, we're keeping a watchful eye on the renovation of the adjacent Gardner's Cottage, where a number of our summer interns will stay as they assist with our exciting research programs. Clearly, we're looking forward to an exciting year of research here at the PEARL!

Welcome to PEARL's New Personnel!

Amanda Knobloch, Ph.D, Environmental Education Coordinator—

Amanda recently received her Ph.D. in Chemical Oceanography from William & Mary's Virginia Institute of Marine Science. Although a chemist by training, she has experience working with students in K-12 and undergraduate settings and hopes to incorporate more chemistry into the PEARL's education programs. Amanda will be working to both implement new and existing K-12 programs as well as develop more programming for Morgan undergraduates.

Brittany Wolfe, M.S., Shellfish Hatchery Manager and Extension Specialist



Brittany recently received her M.S. in Marine Biology from the University of North Carolina - Wilmington. She has an extensive background in oyster aquaculture, having worked at major research shellfish hatcheries in both Virginia and North Carolina. Brittany will serve as the both the manager of PEARL's oyster hatchery and also as the lead of PEARL's extension and outreach to local shellfish growers.

Morgan State University
Patuxent Environmental and
Aquatic Research Laboratory
10545 Mackall Rd.
St. Leonard, MD 20685

Phone: 443-885-5926
Fax: 443-885-8402
E-mail: jody.gregory@morgan.edu

morgan.edu\pearl

Looking for a Research Assistantship in Oyster Genomics Research?

The Morgan State University Patuxent Environmental and Aquatic Research Laboratory (MSU PEARL) is recruiting one or more graduate students – at either the Master's and/or PhD level – to provide research support for MSU PEARL Scientist Dr. Ming Liu's **Oyster Genomics and Breeding Program**. Dr. Liu's research program focuses on two key objectives: 1) identifying associations between oyster genomic characteristics and oyster traits beneficial to the growing aquaculture industry, and 2) developing novel genomic tools and approaches to improve the survival and growth of oysters. The candidate will work with Dr. Ming Liu to develop a thesis or dissertation that contributes to one or both of the objectives above.

For more information, visit www.morgan.edu/pearl

Check out the PEARL on:

Facebook: facebook.com/msupearl Instagram: @MSU_PEARL
Twitter: @MSU_PEARL