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The Morgan State University
Patuxent Environmental and Aquatic Research Laboratory



Structure for Center Program Reviews

- The Committee will review the overall description of the Center and its:
 - Structure
 - Mission
 - Vision
 - Major Goals/Objectives, etc. (with metrics)
- The Committee will also consider other important **Figures of Merit** including, but not limited to:
 - Scholarly Publications
 - External Presentations
 - External Grants
 - Research Students Trained
 - Community Outreach Activities
 - Tech Transfer Activities
 - Research Expenditures
 - The Center's Impact on the Baltimore Community, the State of Maryland & the Academic Discipline

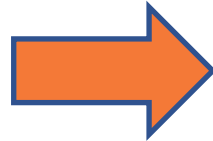
About MSU PEARL

- Founded in 1967 by the Academy of Natural Sciences in Benedict, MD
- Moved downriver (and to Calvert County) in 1994 - Jefferson Patterson Park
- Laboratory transferred to Morgan State University in 2004; Dr. Kelton Clark 1st Director of Morgan PEARL (2004-2017)
- 22,000 square foot laboratory and office building
- Fleet of research vessels, research dock, seawater system, oyster hatchery, and more
- 6 full-time, state-funded staff under PEARL budget; 26 full and part-time paid staff



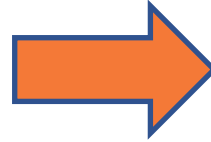
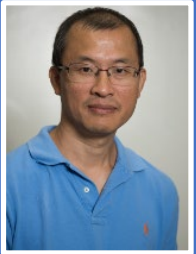
Morgan PEARL – Four Key Focus Areas

Aquaculture



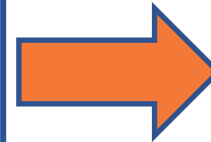
Mission: To improve the performance of aquacultured shellfish and develop new culture technologies that benefit the Maryland and U.S. aquaculture industry

Coastal Ecology



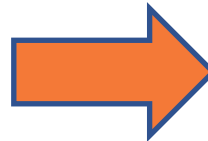
Mission: To understand how both natural and human-induced ecosystem changes affect coastal aquatic natural resources of the Chesapeake Bay and beyond

Environmental Economics



Mission: To understand how environmental policies and natural resource management affects human social and economic well-being

Environmental Education



Mission: Provide active learning experiences in the classroom and field to K-12, undergraduate, and graduate students to train the next generation of scientists

Summer 2022

Full-time Scientists



PEARL Director



Graduate Students



Research Technicians



7 - Morgan Budget Support

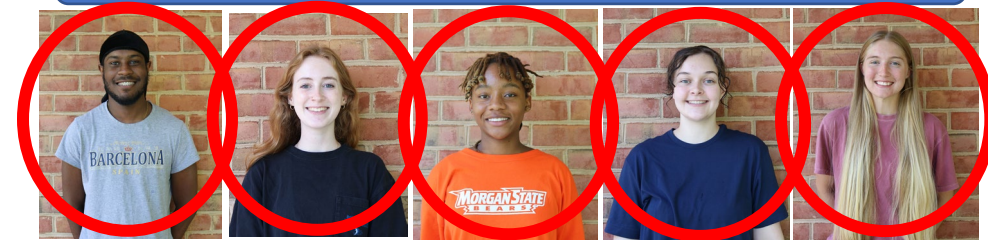
- 1 Director
- 3 Scientists
- 3 Support Staff

19 - Grant/Contract Support

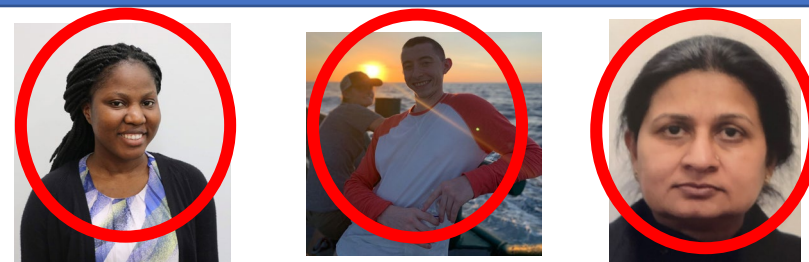
(circled in red)

- 2 Scientists
- 3 Research Technicians
- 3 Postdocs
- 6 Graduate Students
- 5 Interns

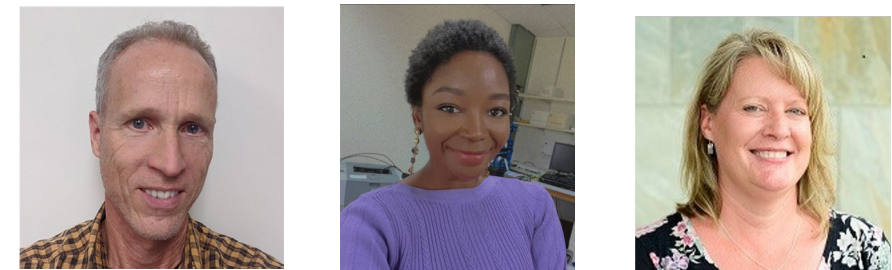
Interns



Postdoctoral Research Associates

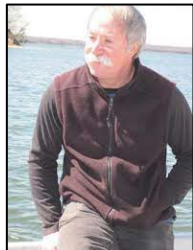
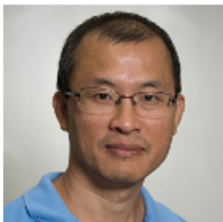


Support Staff



Summer 2017

Full-time Scientists



PEARL Director



7 - Morgan Budget Support

- 1 Director
- 1 Scientist
- 3 Support Staff

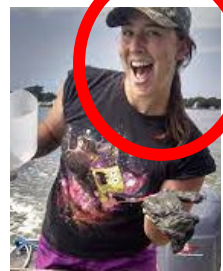
19 - Grant/Contract Support

(circled in red)

- 2 Scientists
- 3 Research Technicians
- 0 Postdocs
- 0 Graduate Students
- 7 Interns

Graduate Students

Research Technicians



Interns



Postdoctoral Research Associates

Support Staff



Summer 2022

Full-time Scientists



PEARL Director



Graduate Students



Research Technicians



7 - Morgan Budget Support

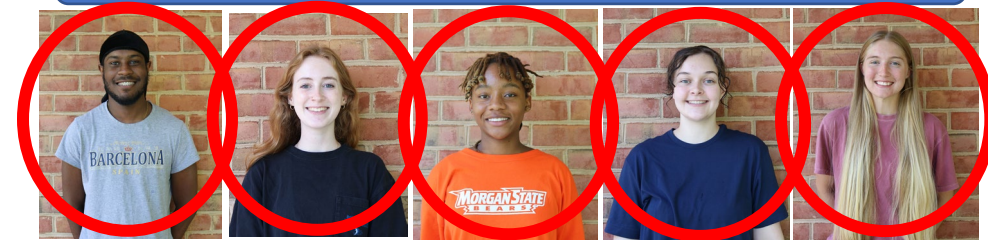
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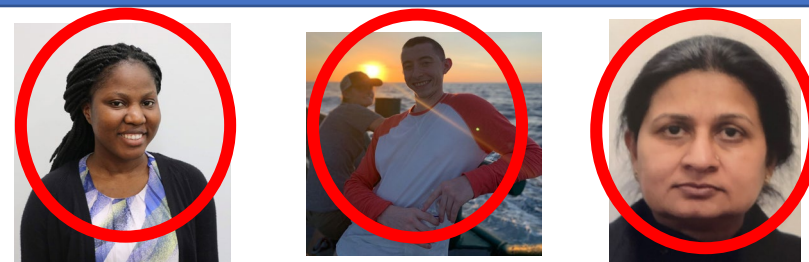
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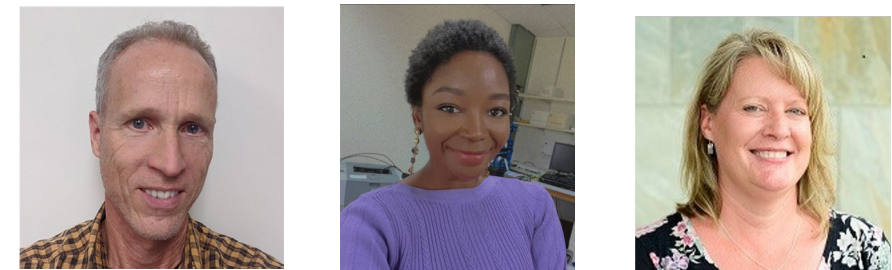
Interns



Postdoctoral Research Associates



Support Staff

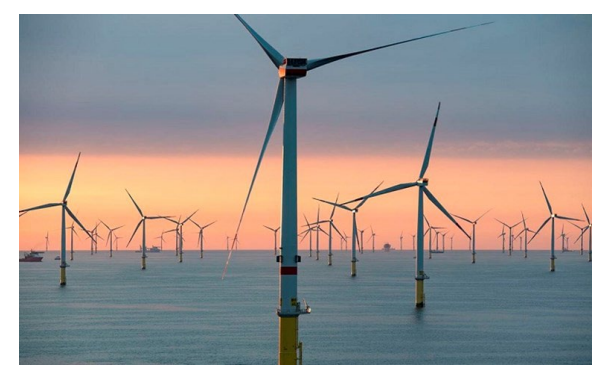




Microplastics- NSF – **\$1.0 mil**



Oyster lines – MD Sea Grant - **\$140k**



Offshore Wind Economics –State of MD - **\$100k**



Salmon Aquaculture Economics - USDA - **\$560k**

22 Active PEARL Projects
\$3.2 million

- Federal – 8; \$2.1 million
- State – 10; \$800,000
- Other – 4; \$300,000



Sika Deer Management - State of MD - **\$100k**



Oyster Reef Restoration Economics - NOAA - **\$250k**



Soft Shell Clams - MD Sea Grant - **\$140k**



Black Bear Management - State of MD - **\$130k**

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, policymakers and environmentally-aware citizens through experiential learning opportunities, mentored research experiences, and environmental education.*

PEARL – Mission Statement

The mission of the Patuxent Environmental and Aquatic Research Laboratory (PEARL) is to provide society with the knowledge to solve its environmental challenges through research, education, and economic development.

2018 Strategic Planning

- Fall 2018
- SWOT Analysis
- Identified Unifying Themes
 - Research, Education, and Public Service/Outreach
- Established Major Goals specific to each Unifying Theme
- Established Objectives and Tasks associated with each Major Goal

Internally supported and driven – No university funds used to support

*** Wayne Swann – Director of OTT played key supporting role

PEARL – Research Major Goals

Goal 1 - Progress towards establishing and maintain major research center with consistent funding from governmental (state/federal) agencies and/or private entities (foundations, private corporations)

Goal 2 - Generate consistent flow of extramural funds supporting research

Goal 3 - Produce and disseminate high-quality research that increases scientific knowledge and benefits stakeholders

Goal 4 - Foster research laboratory culture and support system that facilitates success for all PEARL researchers and staff, from skill acquisition, grant writing, project management, and publication

RESEARCH GOAL 1:

MD House Bill 1228 a Success!

HB 1228 establishes various programs & goals related to oysters in Maryland

Total to Morgan PEARL

\$2.5 million to be used for infrastructure upgrades to support increased oyster production & research.

Potential Upgrades Includes:

- Enhanced Seawater System
- Expansion of Oyster Hatchery
- Acquisition of Research Vessel



Example Vessel



MORGANTM
PATUXENT ENVIRONMENTAL AND
AQUATIC RESEARCH LABORATORY

RESEARCH GOAL 2:

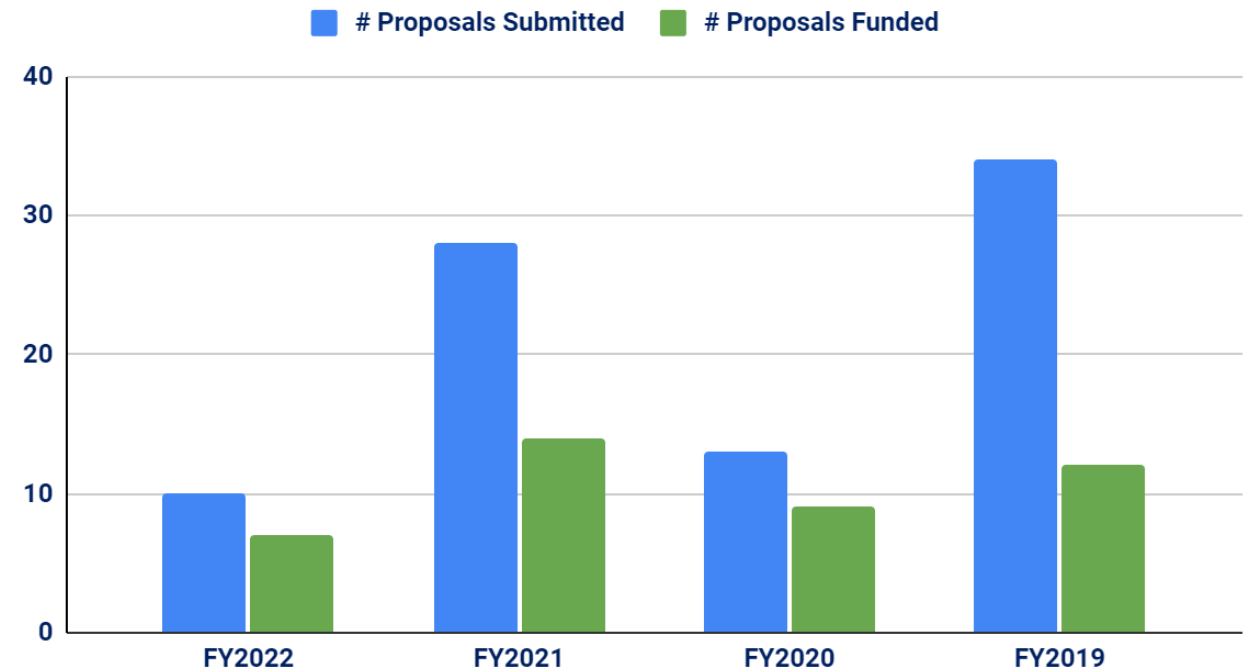
Number of Submitted & Funded Proposals

Between FY2019-FY2022
a total of

85 proposals submitted

42 proposals funded

Number of Proposals Submitted and Awarded by FY



RESEARCH GOAL 2:

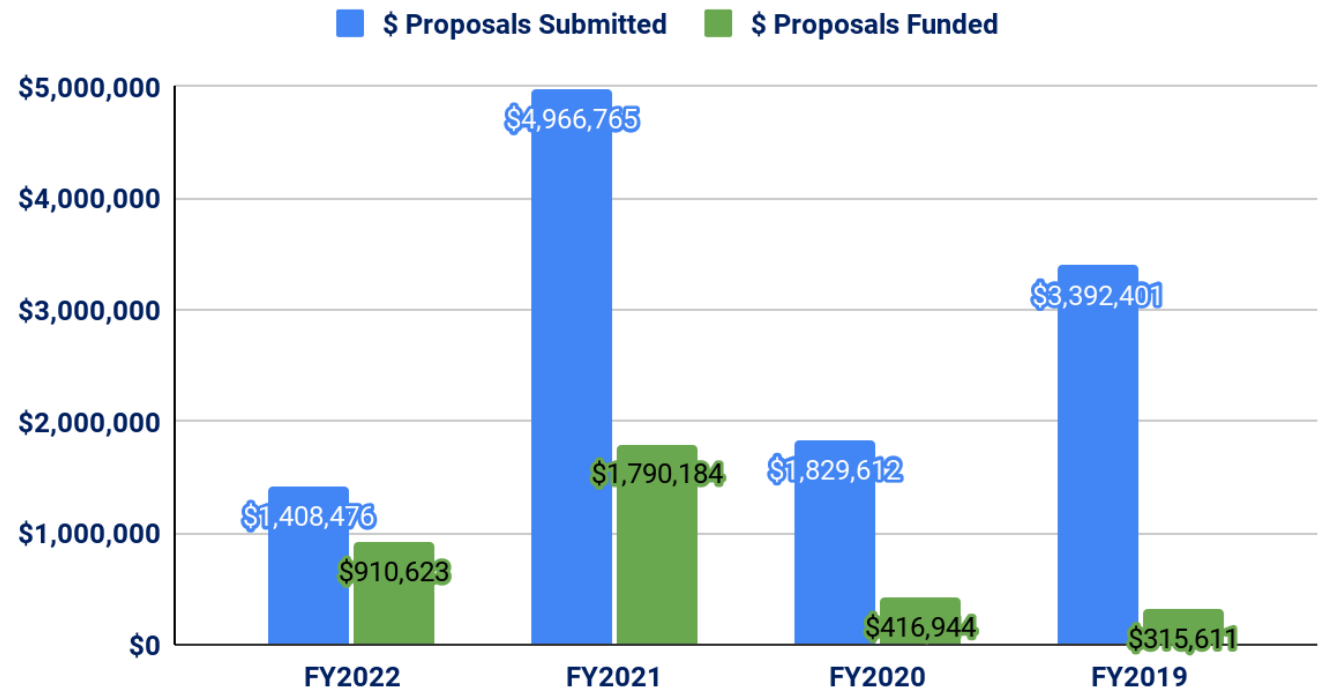
Amount of Submitted & Funded Proposals

Between FY2019-FY2022
a total of

\$11.5m proposals submitted

\$3.4m proposals funded

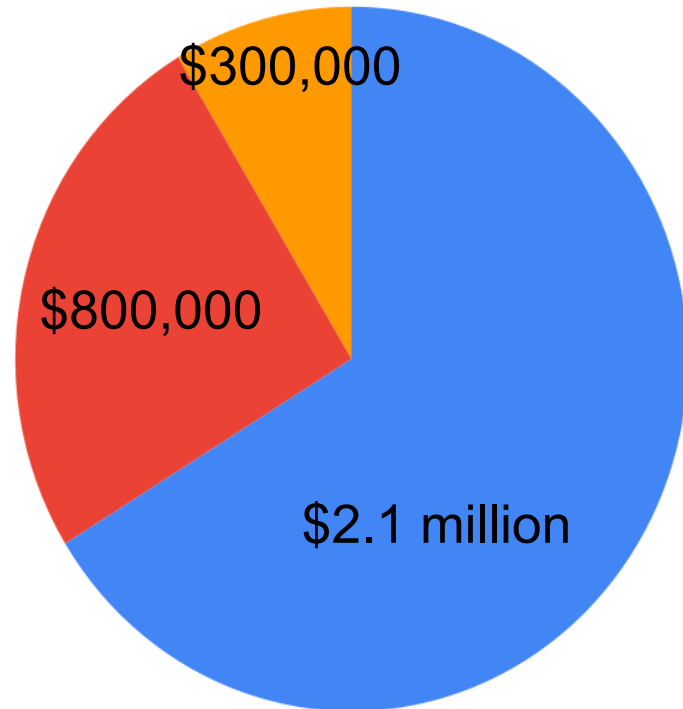
Amount of Proposals Submitted and Funded by FY



RESEARCH GOAL 2:

Total Current & Pending Projects

Current Projects



● Federal (8) ● State (10) ● Other (4)

Total = \$3.2 million

9
Pending
Proposals for
\$1.5m

RESEARCH GOAL 3:

Publications and Presentations

From 2019 to current

67

articles have been published
in peer reviewed literature
by one or more PEARL
researchers and students

From 2019 to current

87

oral presentations or posters
have been presented
by one or more PEARL
researchers and students

PEARL – Education Major Goals

Goal 1 – Develop presence and relevance in Morgan State University undergraduate and graduate education

Goal 2 -Maintain and enhance current PEARL Education successes in experiential learning

Goal 3 - Provide tech/vocational training opportunities and extension support

Goal 4 - Increasing diversity in the environmental sciences

Education GOAL 1, 4:

New Morgan State University
Bachelor of Science
“Coastal Science & Policy”!!!

Design of this
Innovative
Program Led by
PEARL Staff

Approved by
MHEC Fall 2021;
Morgan Launch
Fall 2023

This unique degree program will prepare
students to:

study, manage, and protect coastal resources

through transdisciplinary science and policy
coursework



Program Description

7 new courses

Distance-learning options

Field-based courses

Student research experiences

Community college partnerships



Outcomes

For Students:

- **Success:** A wide range of careers in government, academia, non-profits, and private firms

For Morgan:

- **Innovative:** Unique program not offered in MD
- **Regional Expansion:** Southern MD educational hub

For Society:

- **Diversity:** Increased diversity in Geosciences

Education GOAL 1, 2, 4:

Undergraduate and Graduate Students

Over the last four years, PEARL
has supported

28

undergraduate interns.
About one-half of those were
Morgan students.

Over the past two years,
PEARL has supported

12

graduate students



Education GOAL 1:



Morgan Graduate Students Living On-Site at PEARL in 2022

Education
GOAL 1, 2, 4:

**Earmark
Success!**



**Morgan's
"Semester by the Bay"**

The objective of this initiative is to:

- *Provide undergraduate students with transformational, semester-long learning experiences at the PEARL*
- *To inspire & prepare students to become leaders in Coastal Science & Policy.*

Funds will support:

- *Program Management & Administration*
- *Student Tuition, Stipends, & Scholarships*
- *Four Core, Student-Centric Research Projects*
- *Summer at the Bay Sessions for Baltimore Inner City Students*

\$1,000,000!

This effort would leverage & support Morgan's new B.S. in Coastal Science & Policy!

Education
GOAL 2, 4:

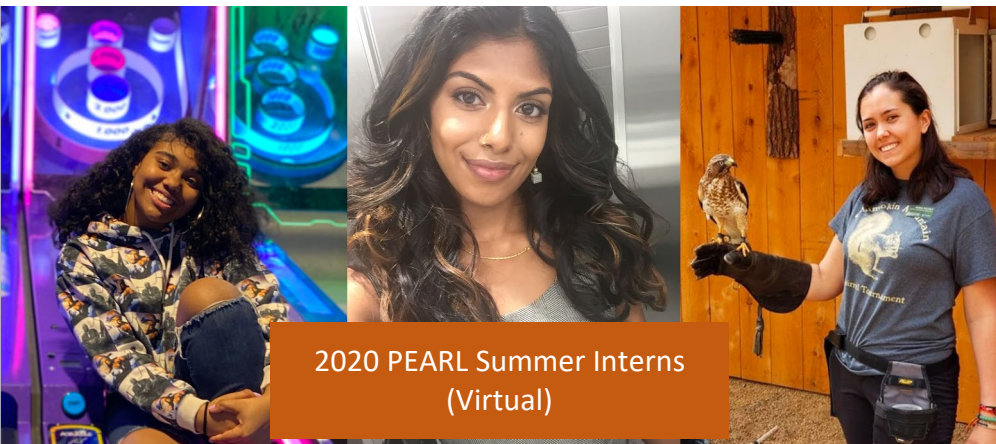
Morgan PEARL Interns – 2019 through 2022



2019 PEARL Summer Interns



2021 PEARL Summer Interns



2020 PEARL Summer Interns
(Virtual)



2022 PEARL Summer Interns

PEARL – Public Service/Outreach

- **Goal 1** - Cultivate and nurture community relationships to increase awareness of PEARL and foster an environmentally literate and knowledgeable local community
- **Goal 2** - Promote and inform stakeholders about PEARL research and education efforts
- **Goal 3** - Benefit resource managers, policy makers and other stakeholders by bringing scientific expertise to bear in policy/management/stakeholder settings
- **Goal 4** - Develop and enhance relationships with Morgan alumni
- **Goal 5** - Maintain and expand relationships with relevant industry stakeholders that could benefit from PEARL's expertise

Over the past two years,
PEARL has participated in

28

community events

Just a few of the outreach events PEARL participated in -

- JPPM Children's Day on the Farm
- Bernie Fowler Wade In
- NAACP Community Day (Juneteenth)
- U.S. Oyster Festival
- St. Mary's STEAM Festival
- Patuxent River Appreciation Days
- Virtual Learning Series
- 6-part Video Series on Oyster Industry (~1,500 views!)

Morgan State/NOAA Virtual Climate Seminar Series

Outreach GOAL 1:

October 2021 - April 2022

- 10 part seminar series - avg. attendance ~ 50 people
- Interdisciplinary range of topics, including:
 - Climate Change: Causal Factors, Processes, and Response
 - How the IPCC has Built Global Understanding of Climate Change
 - How Climate Change Throughout History Informs What We Know Today

First seminar led by Morgan President David Wilson and former NOAA Director of Research Craig McLean



Post Seminar Series Survey - Results

- 11 responses
 - 73% attended at least 5 seminars
 - 64% would be interested in attending an in-person event
 - 100% of respondents would attend future seminars
 - Respondents most interested in:
 - Vulnerability of natural systems to climate change
 - Mitigating climate change

Outreach GOAL 2:

Inform Stakeholders

THE MORGAN PEARL OUR BI-ANNUAL NEWSLETTER

Spring 2022

THE MORGAN PEARL

Director's Update

I write this note in mid-April, with unseasonably cool weather and forecasted high temperatures struggling to break 50 degrees. The wild oyster harvest season is over, the blue crab season has officially begun... So, despite the weather trying to say otherwise - Marylanders know that Spring is here!


Spring is a time of rejuvenation, renewal and growth. The PEARL - with a rich history dating back to 1967 - is experiencing its own exciting phase of renewal and growth. Since I wrote to you last Fall, PEARL has added three new staff. Dr. Matthew Woodstock comes to the PEARL from Florida International University, working with PEARL researcher Tom Ihde to model the ecological and economic impacts of oyster reef restoration in the Virginia portion of the Chesapeake Bay. Jennifer Jun comes to the PEARL from St. Mary's College of Maryland, and will also be working with Tom Ihde to explore potential contaminants in Chesapeake Bay Blue Crabs. Key new support personnel include our new Network Administrator Jaide Carswell and Oyster Hatchery Technician Leigh Wolfe-Bryant.


PEARL's on-site graduate student cohort is growing as well! Morgan PhD Candidate Abubakar Ringim has now joined fellow Morgan PhD candidate Shivish Bhandari in the Gardener's Cottage - a historical residence that is a stone's throw from the PEARL building. It is both exciting and frustrating that PEARL housing constraints are currently preventing more graduate students from working on-site with their research advisors. All in all, too much student interest for too few rooms is an OK (short-term) problem to have, and I am working a number of angles to increase on-site PEARL housing options that can meet the increasing demand from Morgan graduate students. The PEARL transition from field laboratory to satellite campus is exciting - no doubt!

Speaking of rejuvenation, PEARL recently hosted 10 Morgan sophomores at the PEARL through the "Second Year Experience" program. Pre-Covid, PEARL was a regular stop for students in this program, and with Covid came an unfortunate two year hiatus. It's great to see students in this program back at PEARL again! And sticking with undergraduate students, it's that time of year for the Summer internship program. The due date has passed, the applications are in, and PEARL is in the process of extending offers to between 5-7 students for 10-week paid summer internships under the supervision of PEARL researchers.

Please explore the entire "Morgan PEARL" newsletter for the details of so many of the people and projects I mentioned above!

All the best to you during this Spring Season,


Scott Knoche



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PATUXENT ENVIRONMENTAL AND
AQUATIC RESEARCH LABORATORY

Morgan PEARL "Our Vision"

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



* Director's Update

* Environmental Economics News

* Education News

* Aquaculture News

* Coastal Ecology News

* New Employees

Next Issue to
drop late
October!

State of Maryland:

- Recreational Fishing Data Collection and Task Force
- Green and Blue Infrastructure Advisory Committee
- Commission on Climate Change – Scientific and Technical Workgroup
- Oyster Advisory Commission
- Patuxent River Commission
- Outdoor Recreation Economics Commission

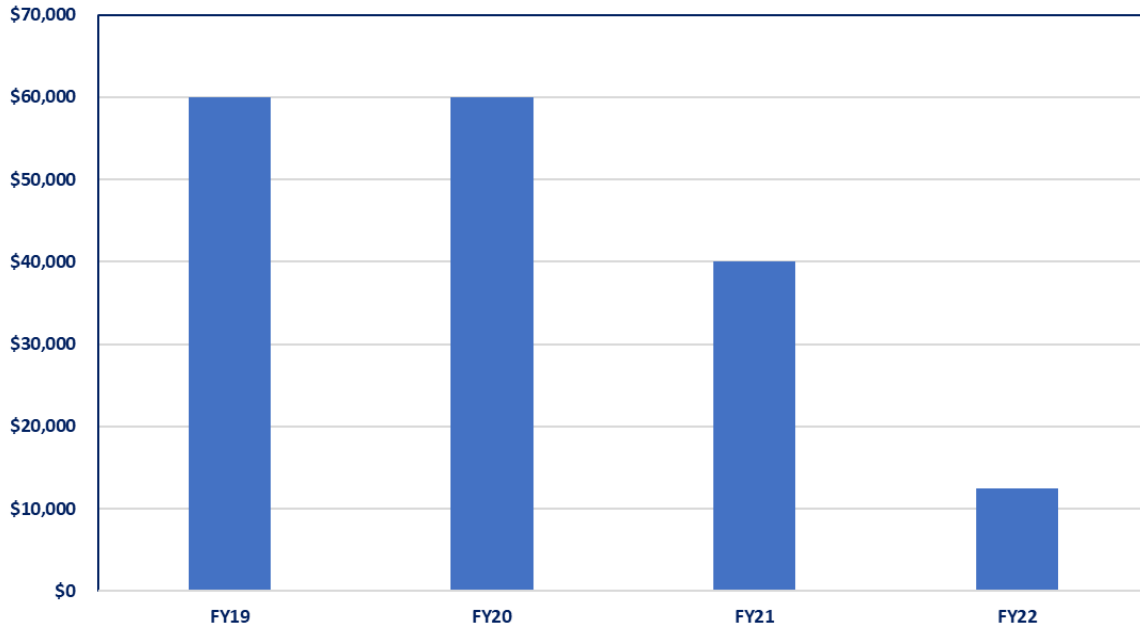
Federal, Academia, Other

- Chesapeake Bay Program Scientific and Technical Advisory Committee
- Chesapeake Bay Program Stock Assessment Committee
- Maryland Sea Grant Institutional Council
- University of Maryland Extension Advisory Council

Outreach GOAL 5:

Tech Transfer Activities

Funding by FY for Office of Tech Transfer Awards



\$172,500

in funding over the
last 4 years

| FY19 |
|---|
| I-GAP Developing Oyster Lines with Unique Shell Pigmentations |
| I-GAP Shoreline Oyster Setting System for Residents |
| FY20 |
| I-WORKS Aquaculture Community Liaison - 2019 |
| I-WORKS Aquaculture Community Liaison - 2020 |
| I-GAP Chesapeake PEARL Oyster Prototype |
| FY21 |
| I-GAP Development of Heat Tolerant Soft Shell Clams |
| FY22 |
| I-WORKS Aquaculture Community Liaison - 2021 |
| I-GAP Polyculture Method for Soft-shell Clams |

Outreach GOAL 5:

Industry Stakeholders



Maryland Industrial Partnerships (MIPS) Program

Shore Thing Shellfish, LLC



Industry Outreach Supported by PEARL grants/contracts, and also by:

MSU Office of
Technology Transfer
and Intellectual
Property



UNIVERSITY OF
MARYLAND
EXTENSION

Next Steps for the Morgan PEARL

- HB 1228 – 4,000 Sq. ft hatchery addition; New vessel, reliable SW system
- Major Center funding
 - NOAA EPP/MSI Cooperative Science Center?
 - NSF CREST?
- Successful Launch and Growth of new B.S. in CS&P
- Cluster Hire of 3-4 scientists?
 - Cluster Hires considered excellent way to foster faculty diversity
- Dormitory with capacity for 40 people???

Thank you!



MORGAN™

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AQUATIC RESEARCH LABORATORY