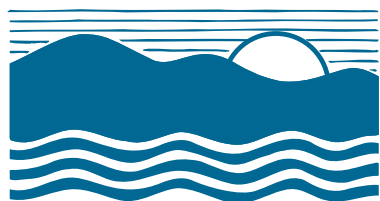


FY 2021 OPERATING BUDGET TESTIMONY

House Appropriations Committee
Education and Economic Development Subcommittee
February 6, 2020

Senate Budget and Taxation Committee
Health, Business and Administration Subcommittee
February 13, 2020

Testimony by Dr. Peter Goodwin, President
University of Maryland Center for Environmental Science



University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

Introduction

I am pleased to appear at this hearing in support of the Operating Budget request for the **University of Maryland Center for Environmental Science** (UMCES). Arriving in the Fall of 2017, it has truly been an honor to serve as only the sixth leader in UMCES' long history.

This written testimony expands on my brief remarks before the Committees by providing some highlights from the past year and responds to the Fiscal 2021 UMCES Budget Analysis completed by the Department of Legislative Services (DLS). In addition, copies of UMCES' 2019 **Annual Report, Guide to Experts,** and **Strategic Initiatives** have been provided to Committee members.

Maryland is unique to have a public university devoted entirely to scientific discovery and graduate education focused on the environment. UMCES has a rich tradition of research and innovation that has supported the citizens and agencies of the State of Maryland since its founding nearly 100 years ago.

As trusted scientific advisors, our faculty provide unbiased research to inform public policy on pressing environmental issues, both in Maryland and around

the world. We have always been distinguished by our ability and willingness to engage policy-makers and support science-based decision-making by managers. In a very real sense, this is part of our institutional DNA.

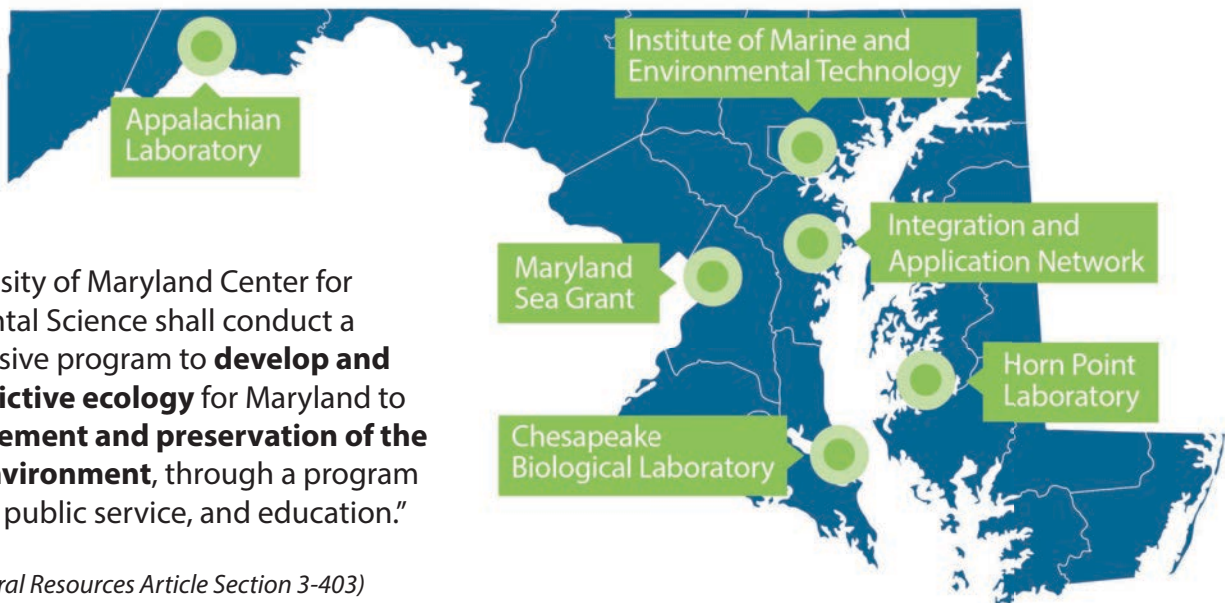
Over the years we have become an indispensable component of the policy-making process for Chesapeake Bay restoration, improving decision-makers' understanding of the challenges and potential solutions before them. As awareness and the urgency of the climate crisis has grown, so has our role in helping Maryland identify, develop, and employ measures to reduce greenhouse gas emissions and vulnerability to climate impacts.

UMCES also serves as a catalyst for engaging environmental experts from across the entire University System of Maryland. As the need for "engaged science" grows as we move further into the climate and biodiversity crises of the 21st century, so will the importance of our work producing the next generation of environmental scientists.

The following highlights are a few of our long-term commitments on behalf of Maryland.

"The University of Maryland Center for Environmental Science shall conduct a comprehensive program to **develop and apply predictive ecology** for Maryland to the **improvement and preservation of the physical environment**, through a program of research, public service, and education."

(COMAR, Natural Resources Article Section 3-403)



Restoring the Chesapeake Bay

State leaders are committed to science-based environmental and resource management. Since our founding in 1925, the University of Maryland Center for Environmental Science has served as an honest broker of scientific information and played a key role in expanding our understanding of the Chesapeake Bay ecosystem.

Coastal resilience

Maryland is under increasing threat from sea-level rise and coastal storms. Tackling our biggest environmental challenges often requires diverse expertise from multiple institutions. Dr. Ming Li has been asked by the National Science Foundation to lead a coalition of scientists from around the country to study the impact of storms, sea-level rise, and climate change on estuaries and bays.

This **nation-wide planning effort** will bring together oceanographers, engineers, ecologists, and social scientists to propose bold new strategies that integrate ecosystem enhancement and recovery into actions taken to protect coastal communities and infrastructure. Partner institutions

include UC Berkeley, Woods Hole Oceanographic Institution, Stevens Institute of Technology, and the University of Massachusetts, among others.

Sea-level rise projections

An UMCES-led group of scientists provides **sea-level rise projections** (expected to range from 0.8 to 1.6 feet from 2000 and 2050) every five years to aid managers in planning for changes to Maryland's 3,000+ miles of coastline. Scientists also provide street-level modeling for local governments to plan for hazard flooding and impacts to coastal communities.

Oyster restoration

UMCES' **oyster expertise** maintains a vital role in improving the management of the Bay's iconic species, the Eastern oyster.

Dr. Michael Wilberg led the first oyster stock assessment in 135 years to help natural resource managers form a plan for oyster restoration in Chesapeake Bay. State-of-the-art advances at the oyster cultivation facility at Horn Point Laboratory have led to record-breaking numbers of spat-on-shell (up to 2 billion per year) being used to help restore the Bay ecosystem, aid in aquaculture efforts, and support the wild fishery.

Conowingo Dam

UMCES scientists led by Dr. Cindy Palinkas recently completed a study to understand the potential impacts of nutrient pollution associated with sediment transported from behind **Conowingo Dam** to the Chesapeake Bay. They found that large storm events can have significant short-term impacts, but the Bay is resilient over the long run due to ongoing restoration and time gaps between events.



Applying Science to our Environment

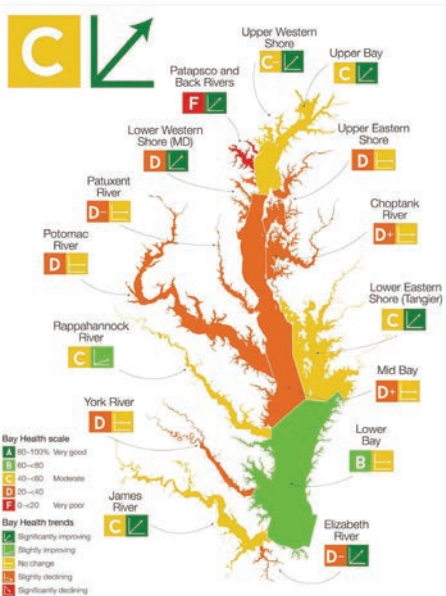
UMCES scientists work across disciplines and in diverse settings—from the Appalachian Mountains to the Arctic, from fisheries to climate change—to understand and discover solutions to challenges in the Chesapeake Bay and around the world.

Warmer winters and blue crabs

Dr. Thomas Miller is predicting that warmer winters in the Chesapeake Bay will likely lead to longer and more productive **blue crab** season. Maryland's crabs spend their winters dormant in the muddy sediment at the bottom of the Bay, emerging only when water temperatures near 50° F. In recent years, this dormancy period has been becoming shorter, and trends indicate it will become shorter still—and could potentially become nonexistent.

Chesapeake Bay report card

UMCES helps provide the scientific foundation behind the state-wide effort to track and communicate the Bay's health and restoration. The annual Bay Health



Report Card serves as the primary scientific communications tool for reaching local governments and watershed residents on the health of their local waters.

Building a better oyster (shell)

Dr. Matthew Gray is working with material scientists at the Maryland Institute College of Art to produce a substrate that is similar to an **oyster shell**, a limited resource, using bacteria grown in a shell mold. Oyster larvae prefer natural oyster shell to become spat, but they choose this material over rock and concrete. Using this material as a reef starter has the potential for landowners to build small reefs that may add protection to their shoreline to reduce erosion and impacts from storm surge without putting more pressure on the few shell reserves that are available.

Future urban climates

Dr. Matthew Fitzpatrick developed a website that has already allowed more than half a billion people around the world visualize the impact of **climate change** on their lives. This interactive web application reveals how 540 urban areas will feel in 60 years. For example, Baltimore will be like Mississippi is today. UMCES and National Geographic are partnering to develop a global cities version of the app.



Graduate Education, Diversity and Workforce Development

The need for “engaged science” is only going to grow as we move further into the climate and biodiversity crises of the 21st century. UMCES is committed to producing the next generation of environmental scientists that are not only prepared to meet the world’s environmental challenges but also reflect the demographic and socio-economic diversity of our population.



Leaders of tomorrow

Out of 69 national finalists, four graduate students from UMCES were awarded prestigious **Knauss Fellowships**—sponsored by Sea Grant and NOAA—to explore careers in coastal and marine policy in executive and legislative branches of government in Washington, D.C.

Workforce diversity in marine science

Led by Dr. Lora Harris and Dr. Jamie Pierson, UMCES and Maryland Sea Grant College have been awarded a \$2.5 million grant from the National Science Foundation (NSF) to help grow the number and **diversity of students** who are interested in STEM fields. This grant is part of a \$10 million, eight-institution SEAS Islands Alliance that will engage under-represented minority students from the U.S. Virgin Islands, Puerto Rico, and Guam in marine and environmental sciences.



crude oil, and Blueblood, a start-up that will offer a sustainable, year-round, high-quality supply of horseshoe crab blood for the biomedical industry.

Wave of Plastic

A NOAA-sponsored education partnership will help Southern Maryland students understand the connections between actions on land and **plastic pollution** in local waterways and the Chesapeake Bay through student environmental stewardship.

Chesapeake DolphinWatch

More than 5,000 “citizen scientists,” have signed up to help researchers **track dolphins** in Chesapeake Bay. Over 2,000 sightings were reported since 2017, and scientists are beginning to link dolphin movement to the temperature, salinity, and oxygen in the water.

Nurturing entrepreneurship

The **Ratcliffe Environmental Entrepreneurs Fellowship** brings in local business leaders to assist in the training of students to be science entrepreneurs. Graduate Suzan Sharestani recently completed seed funding for her start-up Minnowtech, an aquaculture technology company enabling shrimp farmers to image shrimp abundance.

Other businesses include Manta Biofuels, a company that grows and harvests algae to produce a renewable and carbon-neutral



DLS Recommendations

The President should comment on how UMCES will be able to cover the increases in CSC.

In order to fund critical CSC increases, including two major facilities renewal projects that are committed to and currently underway, UMCES will reallocate funds from other sources in FY 2021 in order to balance the budget. We will defer planned technology infrastructure upgrades and other building maintenance and repair projects to cover these costs.

USM Budget

APPROVE the Governor's FY 2021 operating budget for the USM as submitted.

REJECT the \$10M cut that that has been recommended in replace of a 1% tuition increase.

REJECT the \$5.7M cut that that has been recommended to cut new Workforce Development Initiative funding.