University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

MISSION STATEMENT
University of Maryland Center for Environmental Science
September 2018

SUMMARY MISSION STATEMENT

Through its four laboratories and two programs across Maryland, the University of Maryland Center for Environmental Science (UMCES) is a research, education, and service institution of the University System of Maryland (USM) and a world leader in the science of coastal environments and their watersheds. UMCES faculty advance knowledge through scientific discovery, integration, application, and teaching that results in a comprehensive understanding of our environment and natural resources, helping to guide the State and world toward a more sustainable future. Through its role as the responsible institution for administration of the Maryland Sea Grant College and numerous collaborative programs with other institutions, UMCES leads, coordinates, and catalyzes environmental research and graduate education within the University System. The Integration and Application Network inspires, manages, produces and communicates timely syntheses and assessments on key environmental issues with a special emphasis on Chesapeake Bay.

UMCES faculty members advise, teach, and serve as mentors to many graduate students enrolled in USM institutions, including in joint degree programs particularly through the System-wide graduate programs in Marine- Estuarine-Environmental Sciences (MEES), in which UMCES has a leading role. Through its participation in the NOAA Living Marine Cooperative Science Center, UMCES is committed to train a diverse environmental workforce. UMCES also delivers its services through environmental science education programs for K-12 students and teachers, pertinent and timely information to the general public and decision makers, technology transfer to industries, and, in collaboration with, the Maryland Sea Grant College.

UMCES contributes to meeting the legislative mandates of the University System of Maryland in numerous ways including: achieving national eminence as one of the world's premier research centers focused on ecosystem science; uniquely integrating research, public service, and education related to the sustainability of environment and natural resources of Maryland and the Chesapeake Bay region; leading the System's nationally ranked graduate program in marine and environmental science; recruiting and retaining a nationally and internationally prominent faculty; attaining research funding and private support far in excess of its state support; promoting economic development; conducting outreach to state and federal agencies; and collaborating with other higher education institutions in Maryland in advanced research and graduate education.

Our mission and key programs have not substantially changed since our last statement submission. The UMCES Mission Statement document was reviewed and approved by our

UMCES Administrative Council, which includes all UMCES Executive Leaders, Administrative Directors, and the Chairs of our Faculty Senate and Graduate Student Councils. Final approval was obtained on August 24, 2018.

INSTITUTIONAL IDENTITY

The University of Maryland Center for Environmental Science (UMCES) is a research, education, and service institution of the University System of Maryland (USM) and a world leader in the science of coastal environments and their watersheds. UMCES' faculty advances knowledge through scientific discovery, integration, application, and teaching that results in a comprehensive understanding of our environment and natural resources, helping to guide the State and world toward a more sustainable future. Through its role as the responsible institution for administration of the Maryland Sea Grant College and numerous collaborative programs with other institutions, UMCES leads, coordinates, and catalyzes environmental research and education within the University System.

UMCES originated more than 90 years ago with the founding of the Chesapeake Biological Laboratory in 1925 and presently conducts programs through four geographically distinct laboratories (Appalachian Laboratory in Frostburg; Chesapeake Biological Laboratory on Solomons Island; Horn Point Laboratory near Cambridge; and the Institute of Marine and Environmental Technology in Baltimore). The Maryland Sea Grant College is located in College Park and the Integration and Application Network has offices in Annapolis.

In addition to the USM legislative mandates in Education Article Section 10-209, UMCES operates under a specific statutory mandate (Natural Resources Article Section 3-403) to "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." In executing this mission, UMCES is an independent institution responsible for generating unbiased science and plays a key role in advancing knowledge in support of Maryland's international reputation for progressive environmental management and sustainable economic development.

The core purpose of UMCES is scientific discovery leading to comprehensive scientific knowledge of our environment and the human consequences of environmental change. Scientific discovery supports the application of knowledge to emerging environmental issues and the education of the next generation of scientists and resource managers. Through these functions, UMCES has become nationally and internationally respected for the excellence and multidisciplinary nature of its research, its success in applying scientific knowledge to the management of ecosystems, including the Chesapeake Bay and its watershed, and its multifaceted collaborations in education.

With UMCES' degree granting accreditation, faculty members advise, teach, and serve as mentors to many graduate students enrolled in USM institutions. Most are enrolled in the System-wide graduate programs in Marine- Estuarine-Environmental Sciences (MEES), in which the UMCES' faculty have a leading role. UMCES faculty also teach and advise graduate students enrolled in the Graduate Program in Life Sciences (GPILS) at the University of

Maryland Baltimore, and graduate programs in Wildlife/Fisheries Biology or Applied Ecology and Conservation Biology at Frostburg State University. Through these multi-campus programs, UMCES is a pioneer in the use of the Interactive Video Network and web-based delivery in graduate instruction. Students focus their M.S. or Ph.D. thesis research in fields such as fisheries science; environmental chemistry and toxicology; ocean science; marine, aquatic and terrestrial ecology; environmental molecular biology and biotechnology; and environmental and natural resource management.

UMCES delivers high-quality services to: K-12 students and teachers through environmental science education programs; the general public and decision makers through timely and pertinent information; and relevant industries (environmental technologies, aquaculture, biotechnology, seafood processing, etc.) through technology transfer directly and in partnership with the Maryland Sea Grant College. Our uniquely focused mission on environmental science education and research is key to promoting student success in the field. UMCES faculty expertise provides students with high quality research experiences and mentoring in the sciences that result in learning success and targeted workforce development opportunities in support of the State Plan student access and success initiatives. UMCES also executes its statutory responsibility to provide sound scientific information and advice to Maryland state agencies and the General Assembly, with the President of UMCES serving on the Governor's Bay Cabinet.

INSTITUTIONAL CAPABILITIES

Facilities and Programs. UMCES operates world-class research facilities at its four locations across the State. These include: specially-designed laboratories with advanced instrumentation for chemical and biological experiments and analyses, including DNA sequencing and advanced molecular biology capabilities; seawater systems for maintenance of and experimentation with marine and aquatic organisms; extensive shellfish and finfish aquaculture facilities; greenhouses; computational and geographic information systems; remote sensing, soil, vegetation, and water analyses, the state-of-the-art research vessel *Rachel Carson*; and automated environmental and oceanographic observing systems. UMCES' faculty has integrated its disciplinary expertise into nationally prominent, foundational research strengths: biodiversity and invasive species; climate and energy; coastal and estuarine science; environmental chemistry and toxicology; fisheries and aquaculture; genes and microbes; ocean science; restoring and sustaining ecosystems; terrestrial ecology and land management; and water resources and watersheds.

Collaboration. A hallmark of UMCES is a collaborative, multidisciplinary approach to discovery, integration, application, and education in response to the challenging environmental issues of the 21st century. UMCES' faculty members actively collaborate with each other and with faculty members at other USM institutions and scientists throughout the world. Through its strong relationship with other USM institutions, UMCES provides high-quality graduate education to more than 85 students based at UMCES' laboratories. These relationships also provide broad opportunities to increase the diversity of participation in environmental science. UMCES is part of a tripartite collaboration with the University of Maryland Baltimore County and the University of Maryland, Baltimore to operate the Institute of Marine and Environmental Technology (IMET). The IMET partnership encompasses a range of research specializations and orientations in support of Maryland's economic development in biological and other

technologies, including: the use of aquaculture and genomics to foster conservation and creation of marine resources and bio-energy; environmental observation and sensor development; oyster reef and marsh restoration; environmental toxicology and remediation; marine biomedicine development; and sustainable ports and urban ecosystems.

National Leadership. UMCES' faculty provide national and international leadership by: directing cutting edge research and developing state-of-the-art environmental observations and models; training graduate students who go on to careers as professors, research scientists, environmental managers, and entrepreneurs; publishing their research results in top scientific journals; conducting national and international assessments of key environmental issues; serving on professional society and editorial boards; and participating in numerous review panels for science programs throughout the world.

Maryland Sea Grant. As the responsible USM institution for the Maryland Sea Grant College, a partnership among the National Oceanic and Atmospheric Administration, University System of Maryland, and State of Maryland, UMCES has an important responsibility to the regional scientific community, as well as state and federal governments. UMCES and Sea Grant share a mission of promoting the conservation and sustainable use of coastal and marine resources contributing to the restoration of Chesapeake Bay and its watershed. UMCES and Sea Grant collaborate to catalyze scientific research and outreach in a manner that fully engages other research and educational institutions in the State, state agencies, and numerous stakeholders to achieve shared goals.

Integration and Application Network. Partnerships are fostered by the Integration and Application Network and a variety of organizations and agencies, both regionally and globally, and has staff located at UMCES laboratories, the US EPA Chesapeake Bay Program office, and at the Maryland Department of Natural Resources. Its environmental assessments are conducted in collaboration with its partners in a manner that enhances their scientific and communication capabilities through shared learning and direct training.

Contributions to USM Mandates. UMCES contributes to meeting the legislative mandates of the University System of Maryland in numerous ways, specifically including:

1. achieving national eminence as one of the world's premier research institutions focused on environmental science;
2. uniquely integrating research, public service, and education related to the sustainability of environment and natural resources of Maryland and the Chesapeake Bay region;
3. leading the System's nationally ranked graduate program in marine and environmental science;
4. recruiting and retaining a nationally and internationally prominent faculty;
5. attaining research funding and private support in excess of its state support;
6. promoting economic development related to aquaculture, biotechnology, environmental technologies, maritime commerce, natural products, energy, and natural resource utilization, with effective technology transfer, commercialization and business development;

7. maintaining active outreach to state and federal agencies, businesses, elementary and secondary schools, and the general public; and
8. actively collaborating with other higher education institutions in Maryland in advanced research and graduate education.
9. promoting increased diversity in our faculty and the student body.

INSTITUTIONAL OBJECTIVES AND OUTCOMES

In accordance with its legislative mandate, the Maryland State Plan for Postsecondary Education, and the USM Strategic Plan, the following institutional objectives and outcomes have been specified:

1. Continue to strengthen UMCES capacity for scientific discovery related to: a) genes to ecosystems diversity and conservation; b) human welfare; c) energy choices; d) water security; and, e) global reach. Collectively, efforts to achieve these objectives support UMCES legislative mandate to develop and apply a predictive ecology in the early 21st century. This goal supports the State Plan Innovation initiative, specifically related to Strategy 10 and 11 as indicated below in item d. Progress will be reflected in part by:
   a. steady growth in sponsored research support;
   b. peer reviewed publications that are widely cited and highly influential;
   c. success in developing and supporting innovative, multidisciplinary, and translational research programs;
   d. encourage and expand entrepreneurship through technology transfer programs as well as training programs for graduate students and faculty; and
   e. peer recognition as a member of the top-most tier of institutions involved in coastal and watershed science.
   f. promote increased diversity and inclusiveness within our faculty and the student body.

2. Continue the development of UMCES' capacity for integration and application, including through the Integration and Application Network (IAN) and the National Socio-Environmental Synthesis Center (SESYNC), which facilitates transdisciplinary integration of environmental sciences and provides a mechanism to provide scientifically sound advice to the environmental and resource management communities of the Chesapeake Bay region and beyond. This goal and related outcomes supports the State Plan Innovation initiative. Progress will be reflected in part by:
   a. broad and effective involvement of UMCES' faculty in integration and application activities;
   b. attraction of substantial external support for these activities;
   c. continued recognition of UMCES as the most effective academic institution in applying environmental science to chart effective courses for the restoration and management of the Chesapeake Bay and its watershed; and
   d. national and international leadership in scientific assessments of critical issues facing the sustainability of coastal environments and their watersheds.

3. Build on UMCES' success in graduate education, by updating and reforming existing programs to meet the changing societal and scientific needs, competing more successfully

for the most qualified students, and providing expanded opportunities for continuing professional education, including video and web-based delivery of instruction. This goal supports the State Plan initiatives to improve practices around student success, specifically targeting Strategy 6 and 7 in the plan. Progress will be reflected in part by:

a. effectiveness in elevating the Marine-Estuarine-Environmental Sciences program and improving its national ranking;
b. stronger qualifications of entering graduate students and greater professional success (awards, placement, etc.) of degree recipients;
c. develop capstone courses in coordination with regional agencies to provide students practical resource management tools; and
d. establishment of a successful program for continuing education for environmental science professionals.
e. increased enrollment of traditionally underrepresented groups within environmental science.

4. Expand the role of UMCES and the Maryland Sea Grant College in environmental education by offering hands-on experiences at the laboratories for students and teachers; contributing to teacher education; and providing state-wide leadership in the dissemination of scientifically sound information to the public. This goal supports the Access initiative in the State Plan, specifically in relation to Strategy 1. Progress will be reflected in part by:
   a. the numbers of k-12 students reached and teachers trained through practical experience; and
   b. increased public understanding of issues confronting Maryland's environment.

5. Support the leadership of UMCES' faculty within the scientific community and advance environmental science and translational research within the University System of Maryland, the State, the Chesapeake Bay region, and the nation. This goal and related outcomes broadly support the State Plan Innovation initiative. Progress will be reflected in part by:
   a. achieving and maintaining nationally competitive salaries for attracting and retaining the most accomplished faculty;
   b. participation of faculty members in national and international scientific activities, including scientific advisory panels and professional societies; and
   c. leadership of collaborative programs in environmental science and sustainability within the USM.

MISSION STATEMENT APPENDIX
University of Maryland Center for Environmental Science
December 2018 Response to MHEC Comments on September 2018 Mission Statement Submission

Section 2: Institutional Identity

MHEC Comment 1. This section should also include a description of all academic programs, with emphasis on academic programs that specifically align with the institution's identity. ***(It does not seem like you've covered this item in this section. Please give a brief, narrative overview of your academic programs and then provide a listing {typed or printed from your website} of programs.)***

UMCES Response

UMCES has long been extensively involved in graduate education on many levels and granted authority during the 2013 Session of the Maryland General Assembly to implement joint graduate degree programs with other degree- granting public institutions in Maryland and to directly develop and implement post- baccalaureate certificate programs in the marine and environmental sciences [Md.Code Ann. Com. Law §3-403(a)(8)]. This milestone legislation followed several agreements and resolutions in 2012 related to developing a joint degree within the MEES Graduate Program between UMCES and the University of Maryland College Park (UMCP). These steps included directives to the presidents of the two institutions by USM Chancellor Kirwan, a Memorandum-Of-Understanding between UMCES and UMCP, authorization by the USM Board of Regents for UMCES to seek accreditation through the Middle States Commission on Higher Education (MSCHE), and an Agreement between UMCES and UMCP on MEES administration and participation in a joint degree program.

UMCES laboratories and faculty advisors currently mentor approximately 95 graduate students who are enrolled in three graduate programs in the USM: 1) the inter-institutional Marine-Estuarine-Environmental-Sciences (MEES) Program administered through the Graduate School and College of Computer, Mathematical & Natural Sciences (CMNS) at UMCP 2) Applied Ecology and Conservation Biology, and Wildlife and Fisheries Management tracks leading to the MS degree in the Biology Department at Frostburg State University and 3) the Graduate Program in Life Sciences (GPILS), administered by the University of Maryland Baltimore. Program and course offerings can be found in https://www.umces.edu/graduate-program.

MHEC Comment 2. This section is intended to be both descriptive of current academic programs and is intended to assist in focusing programmatic emphases for future development. The institution's priorities for academic program development and the future direction of the institution in terms of fields of study and degree level should be specified. These academic priorities should be related to specific initiatives identified in the State Plan. ***(Once you describe your academic programs, please include the institution's priorities for academic program development and the future direction of fields of study. Additionally, explicitly describe the relationship between your academic priorities and the State Plan. If you do not have plans for the future, state that.)***

UMCES Response
Over the next 5 years, UMCES will explore expansion of its graduate program offerings through two initiatives:

1) A Masters of Advanced Studies (MAS), that addresses specific environmental workforce needs and does not require an independent research thesis; and
2) Graduate certificate programs in: (1) Ecosystem Restoration, (2) Environmental Statistics and Bioinformatics, (3) Entrepreneurship for Emerging Environmental Technologies; and 4) Visualizing, Synthesizing and Applying Science.

Both initiatives will likely be explored in cooperation with graduate schools at other USM campuses. Through these initiatives and continued expansion of its existing graduate programs, UMCES hopes to grow its total graduate student body by approximately 50% and to foster innovation and workforce preparedness in Environmental Science, Policy, and Technology, in keeping with the Innovation goals of the MHEC State Plan for Postsecondary Education.

Section 3: Institutional Capabilities

MHEC Comment 3. This section should provide an overview of the organization of the institution. ***(This can be an organizational chart or narrative.)***

UMCES Response
UMCES is a research, education, and service institution of the USM and a world leader in the science of coastal environments and their watersheds. It is one of twelve institutions included in the USM. UMCES' faculty advances knowledge through scientific discovery, integration, application, and teaching that results in a comprehensive understanding of our environment and natural resources, helping to guide the State and world toward a more sustainable future. Through its role as the responsible institution for administration of the Maryland Sea Grant College and numerous collaborative programs with other institutions, UMCES leads, coordinates, and catalyzes environmental research, education, and outreach within the University System.

The UMCES Executive Council comprises of officers comprising the President, Vice Presidents, Chief of Staff, and Laboratory Directors are responsible for oversight and coordination of the Laboratories, including graduate students, and external representation to the USM, its clients and constituents. The UMCES President is a member of the Council of University System Presidents, with responsibilities delegated by the Board of Regents and Chancellor that are equivalent to those of Presidents of other USM institutions.

Please see attached UMCES Organization Chart

MHEC Comment 4. This section should state the relative emphasis the institution places on teaching, research, and public service, and how the institution's primary functions relate to the fulfillment of the goals and strategies in the State Plan. ***(All or most of the first paragraph of the Institutional Identity section begins to address this item. Please include additional language to help illustrate the relative emphasis you place on teaching, research, and service. Additionally, incorporate an explanation of how your primary function relates to the fulfillment of goals in the State Plan.)***

UMCES Response
As stated in its Institutional Identity, UMCES operates under a specific statutory mandate (Natural Resources Article Section 3-403) to "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." The core purpose of UMCES is scientific discovery leading to comprehensive scientific knowledge of our environment and the human consequences of environmental change. Scientific discovery supports the application of knowledge to emerging environmental issues and the education of the next generation of scientists and resource managers. UMCES' primary emphasis on research, followed by service and education, is also in keeping with the USM Policy on Faculty Workload and Responsibilities for Non-Degree Granting Institutions. UMCES relative priorities for research, service, and education directly support the Innovation goals of the MHEC State Plan for Postsecondary Education.

MHEC Comment 5. The institution should describe current (and future) offices, departments, schools, and resources. ***(You cover some of this when you describe the labs in paragraph two of the Institutional Identity section. Please include that information here and offer other details of current and future offices, departments/programs within the labs, and resources. If you do not have plans to establish new offices, etc., state that.)***

UMCES Response
Each UMCES Laboratory is administered by a Director, who is responsible for faculty and scientific staff, facilities operations, and fiscal administration. The UMCES Center Administration is located primarily on the Horn Point campus in Cambridge and operates under the President and Vice Presidents for Administration, Institutional Advancement and Science Applications. The office of the Vice President for Education is currently located at the Horn Point Laboratory in Cambridge. Additional administrative offices are in Annapolis, MD and primarily house the UMCES Integration and Application Network (IAN). The UMCES Integration and Application Network (IAN), established in 2002, delivers timely syntheses and assessments on key environmental issues, with a special emphasis on Chesapeake Bay and its watershed. Under the direction of the UMCES Vice President for Science Applications, IAN is a Center-wide program that collaborates broadly with agencies and institutions, both regionally and globally. UMCES is looking to expand our facilities at one of our locations to include a collaborative learning and research space "collaboratory" over the next five years.

Section 4: Institutional Objectives and Outcomes
MHEC Comment 6. The institution's continuing and future commitment to equal education opportunity obligations should be expressed and specific action or program priorities indicated.

UMCES Response
UMCES, through its current Strategic Planning process, is committed to be an exemplar of environmental science professionals that reflects the face of communities served by its work. Knowledge discovery accelerates and the societal relevance of scientific research improves when supported by a diverse workforce. Building a culture that promotes these goals will require new commitments. UMCES will enhance diversity of interns, graduate students, faculty, and staff,

cultivate inclusivity through professional development and innovative mentoring, and incentivize change via individual and institutional performance metrics.

UMCES, in partnership with UMD, is also committed to recruiting and providing funding opportunities to increase underrepresented minority participation and admissions to the Marine Estuarine and Environmental Science graduate program.

MHEC Comment 7. The institutional assessment should provide a mechanism for on-going review and refinement of goals. These mechanisms should be identified and discussed in the context of each objective. ***(Describe the process that's in place to review and refine institutional goals. What's the planning cycle? When and how are goals reviewed and refined? Who's involved?)***

UMCES Response
UMCES utilizes two review and planning processes to refine and develop institutional goals and objectives and to inform our Middle States Commission on Higher Education (MSCHE) accreditation reviews. The first is our institutional Strategic Plan review which occurs on average a six-year cycle. Our last completed Strategic Plan was our 2012 Focus on the Future report which was to be used to inform decision making through 2018. UMCES is currently in the process of developing and updating our Strategic Plan going forward due to be completed in early 2019. The process involves the entire campus community and external stakeholders. Faculty, staff, students, Board members, partner institutions and State agencies are all involved in the process and provide input and feedback. The second process is the UMCES Institutional Assessment which occurs on a two year cycle and was recently implemented as a result of our MSCHE accreditation recommendations. This process results in a "report card" type document that assesses what our priorities should be, what we are doing well and what we need to improve, and how we achieve success in these areas. This process starts as an internal feedback process which includes the entire campus community and will result in the engagement of an external assessment group to assist with the analysis of the information and data gathered to enhance the Strategic Plan and update our institutional goals and objectives going forward.