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Application to Join the North Atlantic Coast Cooperative Ecosystem Studies Unit (NA CESU)

Please accept our application to join the North Atlantic Coast Cooperative Ecosystems Studies Unit. We have read the CESU agreement and agree to support the CESU mission and goals and fulfill the roles and responsibilities of a non-Federal partner. We understand and agree to the 17.5% limit on overhead cost rate for activities conducted through the NA CESU. In addition, we agree to relay agency-specific research, technical assistance, and educational needs and associated funding opportunities throughout our organization.

Through its laboratories and locations 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:



[Appalachian Laboratory](http://www.umces.edu/al) (<http://www.umces.edu/al>)

The Appalachian Laboratory is dedicated to the study of terrestrial and freshwater ecosystems: to better understand the effects of natural and human-induced changes on organisms, landscapes, and biogeochemical and hydrological cycles. Its mission is to unravel the consequences of environmental change, manage natural resources, restore ecosystems, and foster ecological literacy.

The Appalachian Laboratory is in western Maryland, the headwaters of the Chesapeake Bay watershed, and is the headquarters and administrative lead of the Chesapeake Watershed Cooperative Ecosystem Studies Unit (CW CESU), a partnership among 28 university/research institutions and 9 federal agencies whose members strive to understand and protect the natural and cultural resources of the region.

[Chesapeake Biological Laboratory](http://www.umces.edu/cbl) (<http://www.umces.edu/cbl>)

Founded in 1925, the Chesapeake Biological Laboratory has long been a national leader in fisheries, environmental chemistry and toxicology, and ecosystem science and restoration ecology.

Located where the Patuxent River meets the Chesapeake Bay, CBL's team of faculty and student researchers are developing new scientific approaches and providing analytical and advisory services on environmental management problems facing our nation, region and the world. The RV Rachel Carson is berthed at CBL, as are oceanographic equipment (opening and closing plankton nets, benthic grabs, trawls, CTD, hydrophones, acoustic receivers) and state-of-the-art seawater facilities.

[Horn Point Laboratory](http://www.umces.edu/hpl) (<http://www.umces.edu/hpl>)

The Horn Point Laboratory (HPL) is strongly engaged in regional and national restoration ecology and oceanography. Expertise in physical, biological, geological oceanography and ecosystem science has provided critical new understandings of climate change, eutrophication, hypoxia and habitat alterations on the Chesapeake Bay and Maryland's coastal waters. Horn Point Laboratory is located on the banks of the Choptank River, a tributary of the Chesapeake Bay on Maryland's Eastern Shore. Unique instrumentation includes an autonomous underwater research robot and a range of observing system buoys (<http://www.umces.edu/hpl/observing-systems>).

[Institute of Marine and Environmental Technology](http://www.umces.edu/imet)
(<http://www.umces.edu/imet>)

Researchers from the University of Maryland Center for Environmental Science at the Institute of Marine and Environmental Technology (IMET) are developing biotech-based solutions to protecting marine ecosystems. IMET capitalizes on the strengths of the University of Maryland Center for Environmental Science, the University of Maryland, Baltimore County and the University of Maryland, Baltimore to conduct marine and environmental research and create technologies designed to foster the protection and restoration of coastal marine systems and their watersheds.

By focusing on the sustainable use of natural resources and improving of human health, IMET brings the research, training and technology transfer capabilities of the partner institutions to Baltimore's Inner Harbor.

[Maryland Sea Grant](http://www.mdsg.umd.edu) (<http://www.mdsg.umd.edu>)

Maryland Sea Grant serves as a bridge between scientific expertise and the needs of people who manage, conserve, enjoy and make their living from the Chesapeake Bay and Maryland Coastal Bays. Sea Grant combines scientific research, education and public outreach and is administered by UMCES. Sea Grant offices are located at the University of Maryland in College Park and is funded by NOAA and the State of Maryland.

[Integration and Application Network](http://www.ian.umces.edu) (<http://www.ian.umces.edu>)

The Integration and Application Network (IAN) mission is to inspire, manage and produce timely syntheses and assessments on key environmental issues. IAN, a part of Center Administration and housed on the grounds of the Horn Point Laboratory, provides science communication services, produces environmental report cards and conducts training and capacity building for science-based organizations. IAN provides online symbol and image libraries, a suite of IAN Press publication, and various video seminars and education modules applicable to ocean sciences.

The Center's 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 graduate education within the University System.

UMCES faculty members advise, teach, and serve as mentors to many graduate students enrolled in USM institutions, particularly through the System-wide graduate programs in Marine- Estuarine-Environmental Sciences (MEES), in which UMCES grants joint degrees with the University of Maryland College Park. 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 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.

As the University System of Maryland's environmental research institution, UMCES provides policymakers and natural resource managers with the most scientifically-advanced information available to tackle the environmental problems facing Maryland, the nation and the world.

The Center's research programs focus on marine, freshwater and estuarine ecosystems, with a focus on four key areas:

- **Ecosystem-based management** looks at all the links among living and non-living resources, rather than considering single issues in isolation. By considering human activities, their benefits and potential impacts within the context of the broader biological and physical environment, the University of Maryland Center for Environmental Science has developed a strong national and international reputation as a leader in its development.
- **Restoration science** seeks to quantify impacts and set ecosystem-based goals for environmental restoration projects designed to improve environmental conditions.
- **Climate change programs** seek to broaden our understanding of climate change's effects on coastal ecosystems, specifically their sensitivity and adaptability to those changes.
- **Environmental observing systems** are critical to connecting ongoing analysis and computer modeling, allowing scientists to analyze data in near real-time and pass that information on to policy makers and natural resource managers to improve the way we take care of our environment.

Ongoing work in these areas is supplemented by comprehensive research programs in several additional areas.

The University of Maryland Center for Environmental Science's Research Fleet is the backbone of the Center's coastal science research programs, providing scientists with access to the Chesapeake Bay and its rivers. Home-ported at the Chesapeake Biological Laboratory in Solomons, the research fleet consists of 16 vessels stationed at the Chesapeake Biological Laboratory and the Horn Point Laboratory.

Christened in November 2008, the R/V *Rachel Carson* is the flagship of the UMCES fleet. The 81-foot *Rachel Carson* <http://www.umces.edu/cbl/research-discovery/rv-rachel-carson> can be rigged to support a wide variety of estuarine and near-coastal oceanographic research projects, including dredging, trawling, coring, water quality observations, plankton sampling, and buoy deployment. The *Carson's* shallow draft, speed, dynamic positioning system, maneuverability, general configuration and versatility make her well-suited for the varied conditions and problems encountered in estuarine and near-coastal research. The *Carson* has had numerous successful cruises in coastal waters off DelMarVa and Cape Cod where it has deployed moored gear with extremely high precision due to its dynamic position/station keeping capabilities.

UMCES scientists have been active participants and serve in leadership positions in the Chesapeake Bay Program, Maryland Coastal Bays Program, State of Maryland cabinet meetings, regional oceanography activities including the Mid-Atlantic Regional Association Coastal Ocean Observing System and Mid-Atlantic Region Council on the Ocean. UMCES scientists regularly translate and communicate scientific results to decision makers, resource managers and the interested public in various public forums and via a variety of public media.

UMCES has been committed to graduate education for more than 35 years. Faculty members teach and mentor MS and PhD students. Historically, students have received degrees and diplomas from degree-granting institutions in the [University of Maryland System](#) (USM), primarily from the [University of Maryland College Park](#) (UMCP). In 2012-13, the Board of Regents and Maryland General Assembly authorized UMCES to become a degree-granting institution within the USM. To do so, UMCES initiated an accreditation process with the [Middle States Commission on Higher Education](#) (MSCHE) and submitted its [Accreditation Readiness Report](#) (ARR) in August 2013. Acceptance of the ARR by MSCHE advanced UMCES to [Candidacy for accreditation](#), which allows UMCES to award graduate degrees. The first MS and PhD degrees were jointly awarded with UMCP in May 2014. UMCES submitted its [Self-Study Design](#) to MSCHE in October 2014. Its approval was followed by initiation of self-study, with completion scheduled by summer 2015. Final evaluation by MSCHE is anticipated in winter 2015-16. If approved, UMCES will then be fully accredited.

Dr. David Secor will serve as our technical representative. His contact information is:

David Secor, Ph.D.
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UMCES Areas of Expertise

Immediately relevant to this CESU request is our expertise as it relates to offshore wind development, coastal oceanography, and coastal living resources, which is highlighted on our website:

<http://www.umces.edu/cbl/wind>. Current projects supported in this area include:

- **Passive acoustic monitoring of marine mammals in the Maryland Wind Energy Area**

In this three-year project we are using passive acoustic monitoring devices to record ambient and marine mammal sounds from a broad range of sources and species to collect baseline data that can be used for informing siting, mitigation measures, assessing environmental impacts for future wind energy developments, and to facilitate marine spatial planning in the area. We are using two types of sound recording devices, the Marine Autonomous Recording Unit (MARU, or pop-up) designed by Cornell University, and the C-POD (Cetacean PODs, tonal click detectors), that will encompass a range of frequencies so that we are able to detect vocalizations from large whales (low frequencies) and small cetaceans (mid to high frequencies). This acoustic monitoring over a two-year period will allow us to capture interannual and seasonal variation in occurrence within the area of potential effect. The use of a grid array design will also facilitate localization of vocalizing whales, to understand spatial patterns of habitat usage. We will therefore be able to characterize ambient noise levels, identify the spatial presence and habitat use of detected marine mammal species and any temporal trends in and around the Maryland Wind Energy Area. Further information is available: <http://www.umces.edu/cbl/project/monitoring-impact-offshore-wind-power-marine-life>

- **Potomac, Hudson River, and Atlantic Striped Bass Telemetry Study**

In support of improved stock assessments and fisheries and habitat management, this three year telemetry study funded by the Atlantic States Marine Fisheries commission focuses on rates of size- and sex-specific migration rates of 100 Potomac striped bass released during 2014. Telemetry assets have been deployed in the Chesapeake mainstem and in coastal regions off Maryland including the Maryland Wind Energy Area. Striped bass telemetry records will be retrieved from these and receivers maintained by other investigators throughout the Chesapeake Bay and US Greater Atlantic region. A second project will tag and release 100 migratory Hudson River striped bass in 2016. Further information is available at <http://fishconnectivity.cbl.umces.edu/PAST>

- **The Chesapeake Sturgeon Initiative**

Atlantic sturgeon reproducing populations were doubted to occur within the Chesapeake Bay as recently as 5 years ago, yet telemetry advances give evidence of at least three reproducing populations. This NOAA Protected Resources-funded project is a coordinated effort by MD and VA scientists to better understand habitat dependencies within the Chesapeake Bay and migrations by Chesapeake Bay sturgeon in coastal waters. During 2013-2015, greater than 100 Atlantic sturgeon will be tagged with telemetry tags and tracked into coastal waters. The strongly collaborative project has resulted in telemetry receivers in all major tributaries, the mainstem, and the Bay mouth. Receivers are also maintained in Maryland Wind Energy Area. A second project (2015-2018) will focus on sturgeon reproduction and tag additional adult sturgeon in Maryland waters. Further information is available at <http://fishconnectivity.cbl.umces.edu/research/CSI>

- **Offshore Wind Energy**

The University of Maryland Center for Environmental Science has a broad range of expertise and a long history of research in the region that makes it exceptionally qualified for studying the marine environment in the Mid-Atlantic and applying this research to the development of offshore wind energy. One of the strategic directions of UMCES is to evaluate and communicate the environmental opportunities and consequences of alternative energy production.

UMCES Experts

AIR QUALITY

Mark Castro, Associate Professor (AL): Atmospheric-biosphere interactions, impacts of land use on water quality
mcastro@umces.edu

Christopher Rowe, Associate Professor (CBL): Impacts of sublethal exposure to pollution, ecotoxicology of coal ash, bioenergetics of aquatic animals
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ALGAE BLOOMS

Pat Glibert, Professor (HPL): Phytoplankton dynamics, nutrient stoichiometry
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Judy O'Neil, Research Associate Professor (HPL): Cyanobacteria ecophysiology and plankton trophodynamics
joneil@umces.edu

Diane Stoecker, Professor (HPL): Physiological ecology and feeding biology of planktonic protists, polar and subpolar microzooplankton and algae
stoecker@umces.edu

Toxic blooms

Allen Place, Professor (IMET): Molecular mechanisms that permit organisms to adapt to unique diets, molecular basis of sex determination, pfiisteria, toxic algae blooms
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ALTERNATIVE ENERGY

Biofuel

Feng Chen, Associate Professor (IMET): Marine microbial ecology, genomics, functional genomics, phage-host interactions, clean green biotechnology
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Yantao Li, Assistant Professor (IMET): Algal molecular biology and biochemistry, engineering of biofuels and bioproducts, algal biotechnology
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Wind Energy

Helen Bailey, Research Assistant Professor (CBL): Movement and habitat use of marine animals, impacts of offshore energy
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CHESAPEAKE BAY RESTORATION

Donald Boesch, Professor and President: Marine and estuarine ecology, marine pollution, national and international marine policy
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Walt Boynton, Professor: Systems ecology, nutrient cycling in estuarine systems, food web dynamics
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William Dennison, Vice President for Science Applications and Professor: ecology of marine plants, assessing ecosystem health
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CLIMATE CHANGE

Donald Boesch, Professor and President: Marine and estuarine ecology, marine pollution, national and international marine policy
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Arctic response

Lee Cooper, Research Professor (CBL): Stable and radioisotope composition of organic materials in coastal waters, high latitude oceanography
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Jacqueline Grebmeier, Research Professor (CBL): Pelagic-benthic coupling, benthic community structure, marine ecosystem dynamics
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Biological invasions/species modeling

Matthew Fitzpatrick, Assistant Professor (AL): Species distribution modeling, simulation modeling, climate change, biological invasions, biodiversity
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Paleoclimatology

Hali Kilbourne, Research Assistant Professor (CBL): Paleoclimatology and paleoceanography, ocean circulation and climate
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Sea level rise

Ming Li, Professor (HPL): Physical oceanography, biological/physical interactions and marine pollution
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COASTAL STUDIES

Hongsheng Bi, Assistant Professor (CBL): Population modeling, zooplankton ecology, spatial statistics
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Lora Harris, Assistant Professor: Systems ecology, primary producers from phytoplankton to macrophytes, ecosystem modeling
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Jeremy Testa, Assistant Professor (CBL): Estuarine biogeochemistry, dissolved oxygen cycling, numerical modeling, estuarine systems ecology
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ENVIRONMENTAL EDUCATION

K-12—**William Dennison**, Vice President for Science Applications and Professor: ecology of marine plants, assessing ecosystem health, science communication
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K-12—**Laura Murray**, Research Professor (HPL): Ecology of marine and estuarine wetland communities, research experiences for environmental education
murray@umces.edu

K-12—**Judy O’Neil**, Research Associate Professor (HPL): Developing online learning tools for middle and high school science programs, research experiences for undergraduates
joneil@umces.edu

K-12—**Cathlyn Stylinski**, Senior Agent (AL): Lifelong science learning, links between teacher education and practice, evaluation of science education programs
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MADE CLEAR (Maryland Delaware Climate Change Education Assessment and Research)

Donald Boesch, Professor and President; director of MADE CLEAR: Marine and estuarine ecology, marine pollution, national and international marine policy
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ENVIRONMENTAL STATISTICS

Dong Liang, Research Assistant Professor (CBL): Spatial statistics, Bayesian methods
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Viacheslav Lyubchich, Research Assistant Professor (CBL): Bayesian statistics, trends in time series
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FISHERIES

Helen Bailey, Research Assistant Professor (CBL): Movement and habitat use of marine animals, predator-prey interactions, impacts of offshore energy
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Robert Hilderbrand, Associate Professor (AL): Ecology, conservation biology, watershed, and stream habitat restoration, dynamic watershed modeling
rhilderbrand@umces.edu

Edward Houde, Vice President for Education and Professor (CBL): Fisheries science, management, ecology, larval fish ecology, resource assessment, menhaden
ehoude@umced.edu

Thomas Miller, Director and Professor (CBL): Ecology of blue crab, stock assessment.
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David Secor, Professor (CBL): Population ecology of fishes, analytical techniques for determining fish life histories and demographics, rockfish
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Michael Wilberg, Associate Professor (CBL): Oyster stock assessment, dynamics of exploited populations, harvest policy development and application
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INVASIVE SPECIES

Lisa Wainger, Research Professor (CBL): Ecological and economic modeling, assessment of invasive species, environmental economic indicators
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Ballast water/green ship technologies

Mario Tamburri, Research Professor (CBL): Larval settlement and recruitment of non-native species, environmental sensor/green ship technologies
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METHANE CYCLING

Laura Lapham, Assistant Professor (CBL): Gas hydrates, methane cycling, sediment biogeochemistry, carbon and nitrogen cycling, sulfate reduction
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NUTRIENT CYCLING

Walt Boynton, Professor: Systems ecology, nutrient cycling in estuarine systems, food web dynamics
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Jeff Cornwell, Research Professor (HPL): Sediment biogeochemistry, nutrient/metal/sulfur cycling in estuaries and coastal wetlands
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Eric Davidson, Director and Professor (AL): Biogeochemistry and nutrient cycling in terrestrial ecosystems, land use and climate change
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Tom Fisher, Professor (HPL): Terrestrial and atmospheric nutrient inputs, nutrient cycling and limitation, primary production of aquatic systems
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Lora Harris, Assistant Professor: Systems ecology, primary producers from phytoplankton to macrophytes, ecosystem modeling
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NUTRIENT POLLUTION/DEAD ZONES

Donald Boesch, Professor and President: Marine and estuarine ecology, marine pollution, national and international marine policy
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Walter Boynton, Professor (CBL): Systems ecology, nutrient cycling in estuarine systems, food web dynamics
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Victoria Coles, Research Associate Professor (HPL): Observation and modeling of large scale ocean circulation, biogeochemical tracer distributions
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William Dennison, Vice President for Science Applications and Professor: ecology of marine plants, assessing ecosystem health
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Solange Filoso, Research Assistant Professor (CBL): Nutrients in aquatic ecosystems, energy production on water resources, stream restoration
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Tom Fisher, Professor (HPL): Terrestrial and atmospheric nutrient inputs, nutrient cycling and limitation, primary production of aquatic systems
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Michael Kemp, Professor (HPL): Systems ecology, primary production and nutrient cycling, trophic structure and ecosystem energetics, seagrass ecology
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OCEANOGRAPHY

William Boicourt, Professor (HPL): Physical oceanographic processes, continental shelf and estuarine circulation
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Shenn-Yu Chao, Professor (HPL): Continental shelf and slope circulation, numerical modeling of ocean circulation processes
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Lou Codispoti, Research Professor (HPL): marine nutrient and carbon budgets, coastal upwelling and chemical oceanographic instrumentation
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Nicholas Nidziako, Assistant Professor (CBL):
Coastal physical oceanography
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Michael Roman, Director and Professor (HPL): Zooplankton ecology, biological oceanography
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Larry Sanford, Professor (HPL): Coastal physical oceanography, boundary layer fluid mechanics and sediment transport
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SEAGRASSES

William Dennison, Vice President for Science Applications and Professor: ecology of marine plants, assessing ecosystem health
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Lora Harris, Assistant Professor: Systems ecology, primary producers from phytoplankton to macrophytes, ecosystem modeling
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Michael Kemp, Professor (HPL): Systems ecology, primary production and nutrient cycling, trophic structure and ecosystem energetics, seagrass ecology
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SEA LEVEL RISE

Donald Boesch, Professor and President: Marine and estuarine ecology, marine pollution, national and international marine policy
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Coastal inundation/modeling

Ming Li, Professor (HPL): Physical oceanography, biological/physical interactions and marine pollution
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Effect on coastal ecosystems

Court Stevenson, Professor (HPL): Ecology of marsh and seagrass systems, Poplar Island
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SEDIMENT

Jeff Cornwell, Research Professor (HPL): Sediment biogeochemistry, nutrient/metal/sulfur cycling in estuaries and coastal wetlands
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Cindy Palinkas, Associate Professor (HPL): Continental-margin sedimentation, formation, deposition and accumulation of sediment
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Larry Sanford, Professor (HPL): Coastal physical oceanography, boundary layer fluid mechanics and sediment transport
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TRACE METALS/TOXICOLOGY

Andrew Heyes, Research Associate Professor (CBL): Trace metal geochemistry, contaminant transport, wetlands and aquatic chemistry
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Carys Mitchelmore, Associate Professor (CBL): Molecular, biochemical and cellular responses of aquatic organisms to inorganic and organic pollutants; determining species-specificity/biochemical pathways and toxic effects.
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Christopher Rowe, Associate Professor (CBL): Impacts of sublethal exposure to pollution, ecotoxicology of coal ash, bioenergetics of aquatic animals
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Johan Shijf, Associate Professor (CBL): Aqueous biogeochemistry of trace metals
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WATER QUALITY

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Michael Gonsior, Assistant Professor (CBL): Diversity of complex organic molecules in aquatic environments analyzed by modern analytical technology
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Lora Harris, Assistant Professor: Systems ecology, primary producers from phytoplankton to macrophytes, ecosystem modeling
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ZOOPLANKTON

Hongsheng Bi, Assistant Professor (CBL): Population modeling, zooplankton ecology, spatial statistics
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James Pierson, Research Assistant Professor (CBL): Zooplankton ecology, trophic interactions in plankton, climate impacts on plankton
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Michael Roman, Director and Professor (HPL): Zooplankton ecology, biological oceanography
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University of Maryland Center for Environmental Science Graduate Education Summary

UMCES is one of twelve institutions within the University System of Maryland. UMCES is the premier research institution aimed at advancing scientific knowledge of the environment.



73

Faculty members who serve as graduate advisors and committee members

215

Graduate students mentored and graduated in the last 11 years

4 Research Laboratories Across the State

- Appalachian Laboratory supporting 13 faculty
- Horn Point Laboratory supporting 29 faculty
- Chesapeake Biological Laboratory supporting 23 faculty
- Institute of Marine and Environmental Technology supporting 8 UMCES faculty



Graduate Student Enrollment Programs

UMCES graduate students reside and conduct research at one of the Center's four research laboratories through three programs:

- [Marine-Estuarine-Environmental Sciences \(MEES\) Graduate Program](#),
- [Graduate Program in Life Science \(GPILS\)](#) and
- [Frostburg State University's Masters Programs in Wildlife and Fisheries and Applied Ecology](#).

MEES Program



Most UMCES students, more than 90%, are enrolled in the University System of Maryland's system-wide MEES Program.

Many of the statistics presented here are derived from the system-wide MEES database. Statistics specific to UMCES are so indicated.

UMCES Faculty advise students in all 6 Areas of Specialization offered by the MEES Program

- Environmental Chemistry
- Ecology
- Environmental Science
- Fisheries Science
- Oceanography
- Environmental Molecular Biology/Biotechnology

UMCES faculty
teach more than

80%

of the courses
offered by the
MEES Program



MEES GRADUATE STUDENT APPLICATION SUMMARY

Data from student applications to the MEES UMD system-wide program. More than 90% of UMCEs students applied to the MEES program.

MEES Masters Applications	2002-2012	2008-2012	2013
Total Applications	1003	391	92
Number Admitted	290	118	31
Number Enrolled	204	96	21
MEES Masters Undergraduate GPA			
Average for Applications	3.31	3.32	3.31
Average for those Admitted	3.41	3.41	3.35







MEES PhD Applications	2002-2012	2008-2012	2013
Applications	1118	435	84
Number admitted	390	146	32
Number enrolled	191	92	24
MEES PhD Undergraduate GPA			
Average for Applications	3.34	3.35	3.43
Average for those Admitted	3.36	3.39	3.47

MEES Average GRE Scores and Percent Rank‡		2003-2011	2012-2013
Admitted	Verbal GRE	157 (74%)	157 (74%)
	Quantitative GRE	155 (60%)	156 (64%)
Enrolled	Verbal GRE	154 (63%)	156 (71%)
	Quantitative GRE	153 (52%)	159 (74%)

‡ All scores are converted to the August 2011 GRE scoring metric



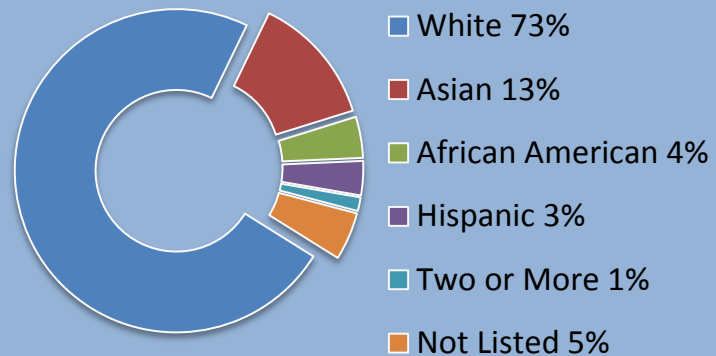
UMCES GRADUATE STUDENT ENROLLMENT SUMMARY

Number of UMCES Students Enrolled in MEES by Area of Specialization	MASTERS Students		PhD Students	
	2008-2012	2013	2008-2012	2013
 Environmental Chemistry	17	2	7	2
 Ecology	26	3	18	2
 Environmental Molecular Biology/ Biotechnology	5	1	6	10
 Environmental Science	30	7	23	8
 Fisheries Science	25	10	14	6
 Oceanography	17	6	29	18

Total UMCES Student Enrollment by Location	2008-2012	2013
Appalachian Laboratory	35	9
Chesapeake Biological Laboratory	96	22
Horn Point Laboratory	95	32
Institute of Marine and Environmental Technology	10	14

UMCES Student Diversity

data from 2009-2013



15% of enrollment consists of International Students

Student Retention Rate

96%

90%

Student Success Rate

Females

65%









Males

35%

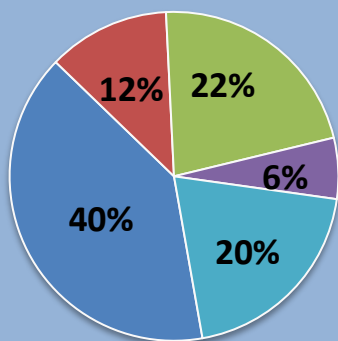


UMCES GRADUATE STUDENT DEGREE SUMMARY

Degrees Awarded to UMCES Students by Area of Specialization	Masters Degrees			PhD Degrees		
	2002-2012	2008-2012	2013	2002-2012	2008-2012	2013
 Environmental Chemistry	22	6	1	15	5	-
 Ecology	16	7	1	14	6	-
 Environmental Molecular Biology/ Biotechnology	4	3	-	2	1	2
 Environmental Science	31	14	1	16	4	-
 Fisheries Science	28	12	1	13	7	1
 Oceanography	18	8	-	19	7	3

UMCES Student Employment Profile

- Academia†
- Private Industry‡
- Federal Government
- State Government
- Not Reported



Masters Degree	2008-2012	2013
Years to Completion	3.5	3.0
Average Grad GPA	3.6	3.6

PhD Degree	2008-2012	2013
Years to Completion	5.9	5.3
Average Grad GPA	3.8	3.6

Employment Notes

† includes continuing education (pursuing doctoral degree), postdoctoral employment, and faculty positions

‡ includes non-profits and environmental technology companies



DEFINITIONS

Graduate GPA

The mean grade point average earned by UMCES students upon obtaining their degree.

GRE Scores

The mean Graduate Record Examination General Test score reported on the graduate applications to the MEES office. Scores for applications in 2012 were converted to the current GRE scoring system using the GRE Concordance Table

https://www.ets.org/s/gre/pdf/concordance_information.pdf

International Student

Based on the permanent residence and citizenship where a student is/was living at the time of application submission to the MEES office.

Student Retention Rate

The proportion of first-time, full-time, degree-seeking students who started in a given cohort year and are enrolled at UMCES the following year.

Student Success Rate

The proportion of graduate students who have enrolled that have either received their degree or are on track for graduation.

Undergraduate GPA

The mean undergraduate grade point average reported to the MEES office.

For additional information please visit

<http://www.umces.edu/education/graduate>

Images were provided by Trace Saxby and Jane Thomas from the Integration and Application Network
University of Maryland Center for Environmental Science (ian.umces.edu/imagelibrary/).





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

MAY - 8 2015

Ms. Angela Richmond
Director, Office of Research and Advancement
University of Maryland Center for Environmental Science
PO Box 775
Cambridge, MD 21613-0075

Dear Ms. Richmond:

I am the National Section 6 Coordinator for the NOAA Fisheries Office Protected Resources and administer a large Section 6 Award to state and academic partners in the Chesapeake region to investigate Atlantic sturgeon reproductive habitats and movements. UMCES is a lead institution in this work and together with MD DNR has greatly expanded the capacity to undertake telemetry investigations in the Chesapeake Bay and recently in shelf waters off DelMarVa.

In my capacity, I wish to endorse the UMCES application to join the North Atlantic Coast Cooperative Ecosystem Studies Unit. A chief interest of my office and for sturgeon conservation in general is continued monitoring of the hundreds of sturgeons now tagged with acoustic transmitters, particularly in coastal regions. Long-term deployments of telemetry receivers will require leveraging resources among agencies such as NOAA, BOEM, NSF, and other partners. The CESU partnership seems an ideal mechanism to efficiently leverage the resources and talents at UMCES and other marine science institutions in deploying observing systems in investigations on coastal impacts of energy development on sturgeons and other species of concern.

Two chief challenges pertain to improved understanding of sturgeon movements within coastal regions: (1) data sharing; and (2) dependable long-term maintenance of telemetry receivers in shelf oceanic environments, which pose difficulties in access and vessel work conditions. Data sharing remains an issue, but UMCES together with other institutions in the current Chesapeake Section 6 project have worked hard to assure that detection data of fish tagged as part of the project, but also detections from other PIs outside the project, are efficiently distributed. In reading through the UMCES application, I note that UMCES has unique capabilities in mooring telemetry receivers and other observing systems. The RV *Rachel Carson*, an 81' oceanographic vessel, has a high precision dynamic position/station



keeping capability that is unparalleled in the region and allows for safe and very accurate deployments and retrievals of moored systems. This is exemplified by the recent successful deployments and retrieval of data for over 50 Atlantic sturgeon in Maryland's wind lease area; new information in that little was known on winter coastal movements of sturgeon.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa Manning", with a long horizontal flourish extending to the right.

Lisa Manning

cc: D. Secor, UMCES