University of Maryland Center for Environmental Science

GUIDE TO EXPERTS





University of Maryland Center for Environmental Science

For more than 90 years, the University of Maryland Center for Environmental Science has led the way toward better management of Maryland's natural resources and the protection and restoration of the Chesapeake Bay. UMCES scientists provide sound advice to help state and national leaders manage the environment and prepare future scientists to meet the global challenges of the 21st century.



LEADERSHIP

Peter Goodwin

President and Professor: Ecosystem restoration and management of aquatic systems, particularly tidal and wetland systems; hydrodynamics modeling; sediment transport and flood risk reduction pgoodwin@umces.edu



Peter Goodwin

Eric Davidson

Director and Professor, Appalachian Laboratory (AL): Biogeochemistry and nutrient cycling in terrestrial ecosystems, land use and climate change edavidson@umces.edu

Bill Dennison

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Russell Hill

Director and Professor, Institute of Marine and Environmental Technology (IMET): Marine microbiology and natural product development, symbiosis of marine sponges, marine bacteriophages hill@umces.edu

Thomas Miller

Director and Professor, Chesapeake Biological Laboratory (CBL): Recruitment and population dynamics of aquatic animals, fish and blue crabs early-life history miller@umces.edu

Fredrika Moser

Director, Maryland Sea Grant College: Marine science policy, invasive species policy, science eduation, coastal sedimentology, geochemistry moser@umces.edu

Michael Roman

Director and Professor, Horn Point Laboratory (HPL): Zooplankton ecology, biological oceanography roman@umces.edu

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Vice President for Education and Professor: Coastal physical oceanography, sediment transport, waves, and physical/biological interactions Isanford@umces.edu

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MEDIA CONTACT

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TOPICS OF EXPERTISE

AGRICULTURAL RUNOFF

Eric Davidson, Director and Professor (AL): Biogeochemistry and nutrient cycling in terrestrial ecosystems, land use and climate change edavidson@umces.edu

Tom Fisher, Professor (HPL): Terrestrial and atmospheric nutrient inputs, TMDLs, cycling of nutrients, aquatic primary production fisher@umces.edu

AIR QUALITY

Mark Castro, Associate Professor (AL): Atmospheric-biosphere interactions, wet and dry deposition of air pollutants mcastro@umces.edu

COAL ASH—

Christopher Rowe, Associate Professor (CBL): Impacts of sublethal exposure to pollution, ecotoxicology of coal ash, bioenergetics of aquatic animals rowe@umces.edu

ALGAL BLOOMS

Judy O'Neil, Research Associate Professor (HPL): Cyanobacteria ecophysiology and plankton trophodynamics joneil@umces.edu

Greg Silsbe, Assistant Research Professor (HPL): Ecology and physiology of algae and their impact on global carbon cycles gsilsbe@umces.edu

TOXIC/HARMFUL BLOOMS— **Pat Glibert**, Professor (HPL): Phytoplankton ecology, nitrogen uptake and mineralization by plankton, primary production and photosynthesis glibert@umces.edu



"As the number and size of offshore wind developments increases, there is a growing need to consider the consequences on marine species. It is essential to identify where whales, dolphins and other species occur to help avoid adverse impacts." —Helen Bailey

Allen Place, Professor (IMET): Genomics of toxin producing dinoflagellates, mitigation of cyanobacteria blooms place@umces.edu

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

ALTERNATIVE ENERGY

BIOFUEL-

Feng Chen, Professor (IMET): Marine microbial ecology, genomics, functional genomics, phage-host interactions, clean green biotechnology chenf@umces.edu

Yantao Li, Assistant Professor (IMET): Algal molecular biology and biochemistry, engineering of biofuels and bioproducts, algal biotechnology yantao@umces.edu

WIND ENERGY—

Helen Bailey, Associate Research Professor (CBL): Movement and habitat use of marine animals, predator-prey interactions, impacts of offshore energy hbailey@umces.edu

CHESAPEAKE BAY RESTORATION

Donald Boesch, Professor: Marine and estuarine ecology, marine pollution, national and international marine policy boesch@umces.edu

Walter Boynton, Professor Emeritus (CBL): Systems ecology, nutrient cycling in estuarine systems, food web dynamics boynton@umces.edu

Jeffrey Cornwell, Research Professor (HPL): Beneficial use of dredged materials for wetland restoration, water quality effects of dredging cornwell@umces.edu

Matthew Gray, Assistant Professor (HPL): Ecosystem services of oysters, modeling ecological outcomes of restoration efforts mgray@umces.edu

Bill Dennison, Vice President for Science Applications and Professor: Ecology of marine plants, assessing ecosystem health dennison@umces.edu

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Sairah Malkin, Assistant Professor (HPL): Sediment biogeochemistry, aquatic microbiology, large lakes and coastal marine systems smalkin@umces.edu

Louis Plough, Assistant Professor (HPL): Population genetics/genomics of marine animals, oyster biology and aquaculture, conservation genetics and restoration lplough@umces.edu

CLIMATE CHANGE

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Victoria Coles, Associate Professor (HPL): Ocean and estuarine circulation, climate change, ecosystem and genomic modeling vcoles@umces.edu

Peter Goodwin, President and Professor: Ecosystem restoration and management of aquatic systems, particularly tidal and wetland systems; hydrodynamics modeling; sediment transport and flood risk reduction pgoodwin@umces.edu

Tom Malone, Professor Emeritus (HPL): Biological ocean processes, phytoplankton ecology, impacts of climate change on the oceans, global ocean observing systems malone@umces.edu

ARCTIC RESPONSE—

Lee Cooper, Research Professor (CBL): Stable and radioisotope composition of organic materials in coastal waters, high latitude oceanography cooper@umces.edu

Jackie Grebmeier, Research Professor (CBL): Pelagicbenthic coupling, benthic community structure, marine ecosystem dynamics jgrebmei@umces.edu

BIOLOGICAL INVASIONS/SPECIES MODELING — **Matthew Fitzpatrick**, Associate Professor (AL): Species distribution modeling, simulation modeling, climate change, biological invasions, biodiversity mfitzpatrick@umces.edu

PALEOCLIMATOLOGY-

Hali Kilbourne, Associate Professor (CBL): Paleoclimatology and paleoceanography, link ocean circulation and climate kilbourn@umces.edu

David Nelson, Associate Professor (AL): Ecosystem ecology, paleoecology, microbial ecology, stable isotope ecology dnelson@umces.edu

REMOTE SENSING-

Andrew Elmore, Associate Professor (AL): Land-use and land-cover change, hydrology, biogeochemistry, remote sensing and spatial analysis aelmore@umces.edu

SEA-LEVEL RISE—

Ming Li, Professor (HPL): Physical oceanography, numerical ocean modeling, biological/physical interactions and marine pollution, coastal inundation, sea-level rise mingli@umces.edu

TERRESTRIAL ECOSYSTEM RESPONSE—

Mark Cochrane, Professor (AL): Earth systems science, wildland fire, climate change, ecology, land cover change, remote sensing mark.cochrane@umces.edu

Eric Davidson, Director and Professor (AL): Biogeochemistry and nutrient cycling in terrestrial ecosystems, land use and climate change edavidson@umces.edu Paul Gugger, Assistant Professor (AL): Molecular ecology, ecological genomics, population/landscape genomics, evolutionary responses to climate change, genetic basis of adaptation pgugger@umces.edu

Xin Zhang, Assistant Professor (AL): Earth system models, nitrogen cycling, socioeconomic drivers of global change xin.zhang@umces.edu

COASTAL STUDIES

Hongsheng Bi, Associate Professor: Population modeling, zooplankton ecology, spatial statistics hbi@umces.edu

Lora Harris, Associate Professor (CBL): Systems ecology, primary producers from phytoplankton to macrophytes, ecosystem modeling harris@umces.edu

Sairah Malkin, Assistant Professor (HPL): Sediment biogeochemistry, aquatic microbiology, large lakes and coastal marine systems smalkin@umces.edu

William Nardin, Assstant Professor (HPL): Estuary hydrodynamics and coastal processes, impact of waves, coastal wetlands evolution wnardin@umces.edu

Cindy Palinkas, Associate Professor (HPL): Effect of coastal structures on nearshore sedimentation cpalinkas@umces.edu

Jeremy Testa, Assistant Professor (CBL): Estuarine biogeochemistry, dissolved oxygen cycling, numerical modeling, estuarine systems ecology jtesta@umces.edu

Ryan Woodland, Assistant Professor (CBL): Trophic and food web ecology, stable isotope ecology woodland@umces.edu

CRABS

Allen Place, Professor (IMET): Population biology and genetics of the blue crab place@umces.edu

Louis Plough, Assistant Professor (HPL): Population genetics/genomics of marine animals, oyster biology and aquaculture, conservation genetics and restoration lplough@umces.edu

POPULATION DYNAMICS—

Thomas Miller, Director and Professor (CBL): Recruitment and population dynamics of aquatic animals, fish and blue crabs early life history miller@umces.edu

Michael Wilberg, Associate Professor (CBL): Stock assessment, dynamics of exploited populations, harvest policy development and application wilberg@umces.edu

"We're trying to predict when the storm comes in, which area will be flooded, which street will be flooded on a very fine scale. This will help emergency responder managers and people in the area of the predicted flooding make better choices as the storm nears." — Ming Li



REPRODUCTION-

J. Sook Chung, Associate Professor (IMET): Crustacean physiology of molting, growth, reproduction, sex differentiation and stress responses chung@umces.edu

SOFT SHELL CRAB DISEASE-

Eric Schott, Assistant Research Professor (IMET): Molecular detection and characterization of aquatic invertebrates, pathogens and viruses, soft-shell crabs schott@umces.edu

ECOLOGICAL MODELING

Matthew Fitzpatrick, Associate Professor (AL): Species distribution modeling, simulation modeling, climate change, biological invasions, biodiversity mfitzpatrick@umces.edu

Peter Goodwin, President and Professor: Ecosystem restoration and management of aquatic systems, hydrodynamics modeling, sediment transport and flood risk reduction pgoodwin@umces.edu

Kenny Rose, Professor (HPL): Ecological modeling, fisheries assessment and management krose@umces.edu

Xin Zhang, Assistant Professor (AL): Earth system models, nitrogen cycling, socioeconomic drivers of global change xin.zhang@umces.edu

ENVIRONMENTAL EDUCATION

Bill Dennison, Vice President for Science Applications and Professor: Ecology of marine plants, assessing ecosystem health dennison@umces.edu **Cathlyn Stylinski**, Senior Agent (AL): Public and K-12 engagement in science, lifelong and community learning about science and the environment, program evaluation cstylinski@umces.edu

MADE CLEAR (Maryland Delaware Climate Change Education Assessment and Research)— **Donald Boesch**, Professor: Marine and estuarine ecology, national and international marine policy boesch@umces.edu

ENVIRONMENTAL STATISTICS

Robert Hilderbrand, Associate Professor (AL): Stream conservation and restoration ecology, stream health, trout rhilderbrand@umces.edu

Dong Liang, Assistant Research Professor (CBL): Spatial statistics, spatiotemporal models, Bayesian methods, remote sensing applications to environment and health dliang@umces.edu

Vyacheslav Lyubchich, Assistant Professor (CBL): Time series analysis, forecasting, applied statistics, non-parametric inference, bootstrap, environmental modeling, random networks lyubchic@umces.edu

FISHERIES

Helen Bailey, Associate Research Professor (CBL): Movement and habitat use of marine animals, predator-prey interactions, impacts of offshore energy hbailey@umces.edu

Robert Hilderbrand, Associate Professor (AL): Stream conservation and restoration ecology, stream health, trout rhilderbrand@umces.edu



"We're combining tree rings with satellite data to find out the growth rate of trees. If trees are growing faster, then they are taking more carbon out of the atmosphere." —Andrew Elmore

Edward Houde, Professor Emeritus (CBL): Fisheries science, management, ecology, larval fish ecology, resource management ehoude@umces.edu

Thomas Miller, Director and Professor (CBL): Recruitment and population dynamics of aquatic animals, fish and blue crabs early life history miller@umces.edu

Genny Nesslage, Assistant Research Professor (CBL): Stock assessment, fisheries management, wildlife management nesslage@umces.edu

Kenny Rose, Professor (HPL): Ecological modeling, fisheries assessment and management krose@umces.edu

David Secor, Professor (CBL): Population ecology of fishes, analytical techniques for determining fish life histories and demographics, rockfish secor@umces.edu

Michael Wilberg, Associate Professor (CBL): Oyster stock assessment, dynamics of exploited populations, harvest policy development and application wilberg@umces.edu

FORESTS/ECOLOGY/LAND USE

Mark Cochrane, Professor (AL): Earth systems science, wildland fire, climate change, ecology, land cover change, remote sensing mark.cochrane@umces.edu

Andrew Elmore, Associate Professor (AL): Land-use and land-cover change, hydrology, biogeochemistry, remote sensing and spatial analysis aelmore@umces.edu

Paul Gugger, Assistant Professor (AL): Molecular ecology, ecological genomics, population/landscape genomics, evolutionary responses to climate change, genetic basis of adaptation pgugger@umces.edu

David Nelson, Associate Professor (AL): Stable isotope ecology, ecosystem ecology, paleoecology, microbial ecology dnelson@umces.edu

Xin Zhang, Assistant Professor (AL): Earth system models, nitrogen cycling, socioeconomic drivers of global change xin.zhang@umces.edu

GENOMICS/GENETICS

Katharina Engelhardt, Associate Research Professor (AL): Wetland ecosystem functioning and services, community ecology, aquatic botany kengelhardt@umces.edu

Paul Gugger, Assistant Professor (AL): Molecular ecology, ecological genomics, population/landscape genomics, evolutionary responses to climate change, genetic basis of adaptation pgugger@umces.edu

Robert Hilderbrand, Associate Professor (AL): Ecology, conservation biology, watershed and stream habitat restoration, dynamic watershed modeling rhilderbrand@umces.edu

Sairah Malkin, Assistant Professor (HPL): Sediment biogeochemistry, aquatic microbiology, large lakes and coastal marine systems smalkin@umces.edu

David Nelson, Associate Professor (AL): Ecosystem ecology, paleoecology, microbial ecology, stable isotope ecology dnelson@umces.edu

Louis Plough, Assistant Professor (HPL): Population genetics/genomics of marine animals, oyster biology and aquaculture, conservation genetics and restoration lplough@umces.edu

INVASIVE SPECIES

Andrew Elmore, Associate Professor (AL): Land-use and land-cover change, hydrology, biogeochemistry, remote sensing and spatial analysis aelmore@umces.edu

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Lisa Wainger, Research Professor (CBL): Ecological and economic modeling, assessment of invasive species, environmental economic indicators wainger@umces.edu

BALLAST WATER/GREEN SHIP TECHNOLOGIES— Mario Tamburri, Research Professor (CBL): Larval settlement and recruitment of non-native species, environmental sensor/green ship technologies tamburri@umces.edu

JELLYFISH

Hongsheng Bi, Associate Professor (CBL): Population modeling, zooplankton ecology, spatial statistics hbi@umces.edu

Raleigh Hood, Professor (HPL): Biological oceanography, jellyfish rhood@umces.edu

METHANE CYCLING

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

Eric Davidson, Director and Professor (AL): Biogeochemistry and nutrient cycling in terrestrial ecosystems, land use and climate change edavidson@umces.edu

Laura Lapham, Assistant Professor (CBL): Gas hydrates, methane cycling, sediment biogeochemistry, carbon and nitrogen cycling, sulfate reduction lapham@umces.edu

MARINE LIFE

Helen Bailey, Associate Research Professor (CBL): Movement and habitat use of marine animals, predator-prey interactions, impacts of offshore energy hbailey@umces.edu

MARINE MICROBIOLOGY

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Victoria Coles, Associate Professor (HPL): Ocean and estuarine circulation, climate change, ecosystem and genomic modeling vcoles@umces.edu

Russell Hill, Director and Professor (IMET): Marine microbiology and natural product development, symbiosis of marine sponges, marine bacteriophages hill@umces.edu

Rosemary Jagus, Professor (IMET): Regulation of gene activity during early development, host defense against virus infection jagus@umces.edu

Sairah Malkin, Assistant Professor (HPL): Sediment biogeochemistry, aquatic microbiology, large lakes and coastal marine systems smalkin@umces.edu

Allen Place, Professor (IMET): Molecular mechanisms that permit organisms to adapt to unique diets, molecular basis of sex determination, pfisteria, toxic algal blooms place@umces.edu

NUTRIENT CYCLING

Walter Boynton, Professor Emeritus (CBL): Systems ecology, nutrient cycling in estuarine systems, food web dynamics boynton@umces.edu

Jeff Cornwell, Research Professor (HPL): Sediment biogeochemistry, nutrient/metal/sulfur cycling in estuaries and coastal wetlands cornwell@umces.edu

Eric Davidson, Director and Professor (AL): Biogeochemistry and nutrient cycling in terrestrial ecosystems, land use and climate change edavidson@umces.edu

Tom Fisher, Professor (HPL): Terrestrial and atmospheric nutrient inputs, TMDLs, cycling of nutrients, aquatic primary production fisher@umces.edu

Michael Gonsior, Assistant Professor (CBL): Diversity of complex organic molecules in aquatic environments analyzed by modern analytical technology gonsior@umces.edu



"Organisms and people feel weather; they don't really feel climate. Climate dictates what your annual average fuel bill may be, but it's the weather events that you're actually experiencing—and those weather events are changing. Those are things that people notice."" —Victoria Coles Lora Harris, Associate Professor (CBL): Systems ecology, primary producers from phytoplankton to macrophytes, ecosystem modeling harris@umces.edu

Sairah Malkin, Assistant Professor (HPL): Sediment biogeochemistry, aquatic microbiology, large lakes and coastal marine systems smalkin@umces.edu

Xin Zhang, Assistant Professor (AL): Earth system models, nitrogen cycling, socioeconomic drivers of global change xin.zhang@umces.edu

NUTRIENT POLLUTION/DEAD ZONES

Donald Boesch, Professor: Marine and estuarine ecology, marine pollution, national and international marine policy boesch@umces.edu

Walter Boynton, Professor Emeritus (CBL): Systems ecology, nutrient cycling in estuarine systems, food web dynamics boynton@umces.edu

Victoria Coles, Associate Professor (HPL): Observation and modeling of large-scale ocean circulation, biogeochemical tracer distributions vcoles@umces.edu

Eric Davidson, Director and Professor (AL): Biogeochemistry and nutrient cycling in terrestrial ecosystems, land use and climate change edavidson@umces.edu

Bill Dennison, Vice President for Science Applications and Professor: Ecology of marine plants, assessing ecosystem health dennison@umces.edu

Solange Filoso, Associate Research Professor (CBL): Nutrients in aquatic ecosystems, energy production on water resources, stream restoration filoso@umces.edu **Tom Fisher**, Professor (HPL): Terrestrial and atmospheric nutrient inputs, TMDLs, cycling of nutrients, aquatic primary production fisher@umces.edu

Sairah Malkin, Assistant Professor (HPL): Sediment biogeochemistry, aquatic microbiology, large lakes and coastal marine systems smalkin@umces.edu

Tom Malone, Professor Emeritus (HPL): Biological ocean processes, phytoplankton ecology, impacts of climate change on the oceans, global ocean observing systems malone@umces.edu

Jeremy Testa, Assistant Professor (CBL): Estuarine biogeochemistry, dissolved oxygen cycling, numerical modeling, estuarine systems ecology jtesta@umces.edu

OCEANOGRAPHY

William Boicourt, Professor Emeritus (HPL): Physical oceanographic processes, continental shelf and estuarine circulation boicourt@umces.edu

Shenn-Yu Chao, Professor (HPL): Continental shelf and slope circulation, numerical modeling of ocean circulation processes chao@umces.edu

Lou Codispoti, Research Professor (HPL): Marine nutrient and carbon budgets, coastal upwelling and chemical oceanographic instrumentation codispot@umces.edu

Victoria Coles, Associate Professor (HPL): Ocean and estuarine circulation, climate change, ecosystem and genomic modeling vcoles@umces.edu

Cindy Palinkas, Associate Professor (HPL): Geological oceanography, sediment dynamics cpalinkas@umces.edu



"We're focusing on oysters because of their importance to Maryland's economy, cultural heritage, and a clean and healthy Chesapeake Bay, and because there is conflict over how to best to restore the oyster resource,. Our goal [with OysterFutures] is to integrate onthe-water knowledge and scientific understanding to help the stakeholders find their best path forward," —Michael Wilberg

Tom Malone, Professor Emeritus (HPL): Biological ocean processes, phytoplankton ecology, impacts of climate change on the oceans, global ocean observing systems malone@umces.edu

Michael Roman, Director and Professor (HPL): Zooplankton ecology, biological oceanography roman@umces.edu

Larry Sanford, Professor (HPL): Coastal physical oceanography, sediment transport, waves, and physical/biological interactions lsanford@umces.edu

OYSTERS

Jeffrey Cornwell, Research Professor (HPL): Restored oyster community effects on water quality, biogeochemical changes associated with oyster aquaculture cornwell@umces.edu

Matthew Gray, Assistant Professor (HPL): Ecophysiology, restoration, ecological role of wild and cultured populations, larval ecology, response to ocean acidification mgray@umces.edu

Elizabeth North, Associate Professor (HPL): Larval fish and zooplankton ecology, estuarine physical oceanography, fisheries recruitment variability enorth@umces.edu **Kennedy Paynter**, Associate Professor (CBL): Comparative physiology of estuarine organisms, oyster disease biochemistry paynter@umces.edu

Louis Plough, Assistant Professor (HPL): Population genetics/genomics of marine animals, oyster biology and aquaculture, conservation genetics and restoration lplough@umces.edu

AQUACULTURE—**Don Meritt**, Principal Agent (HPL): Aquaculture, oyster and invertebrate ecology dmeritt@umces.edu

STOCK ASSESSMENT—

Michael Wilberg, Associate Professor (CBL): Oyster stock assessment, dynamics of exploited populations, harvest policy development and application wilberg@umces.edu

ROCKFISH

Edward Houde, Professor Emeritus (CBL): Fisheries science, management, ecology, larval fish ecology, resource management ehoude@umces.edu

Allen Place, Professor (IMET): Development of a fish-free diet for aquaculture place@umces.edu

David Secor, Professor (CBL): Population ecology of fishes, analytical techniques for determining fish life histories and demographics, rockfish secor@umces.edu

SEAGRASSES

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Katharina Engelhardt, Associate Research Professor (AL): Wetland ecosystem functioning and services, community ecology, aquatic botany kengelhardt@umces.edu

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SEA LEVEL RISE

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Andrew Elmore, Associate Professor (AL): Land-use and land-cover change, hydrology, biogeochemistry, remote sensing and spatial analysis aelmore@umces.edu

William Nardin, Assistant Professor (HPL): Impact of storms and sea level rise on wetlands ecogeomorphology wnardin@umces.edu

Cindy Palinkas, Associate Professor (HPL): Sea-level rise effect on ecosystems, response of tidal marshes cpalinkas@umces.edu

COASTAL INUNDATION/MODELING— Ming Li, Professor (HPL): Physical oceanography, biological/physical interactions and marine pollution mingli@umces.edu

EFFECT ON COASTAL ECOSYSTEMS-

Court Stevenson, Professor Emeritus (HPL): Ecology of marsh and seagrass communities, effects of sealevel rise on coastal ecosystems, wetland restoration at Poplar Island and creation of "living shorelines" in Chesapeake Bay court@umces.edu

SEDIMENT

Jeff Cornwell, Research Professor (HPL): Sediment biogeochemistry, nutrient/metal/sulfur cycling in estuaries and coastal wetlands cornwell@umces.edu

Peter Goodwin, President and Professor: Ecosystem restoration and management of aquatic systems, particularly tidal and wetland systems; hydrodynamics modeling; sediment transport and flood risk reduction pgoodwin@umces.edu

Sariah Malkin, Assistant Professor (HPL): Food web interactions and cycling in bottom waters smalkin@umces.edu

William Nardin, Assstant Professor (HPL): Sediment transport modeling and coastal morphodynamic wnardin@umces.edu

Cindy Palinkas, Associate Professor (HPL): Field-based observations of sediment transport and deposition in intertidal, fluvial, and estuarine environments; feedbacks between sediment and vegetation dynamics cpalinkas@umces.edu

Larry Sanford, Professor (HPL): Coastal physical oceanography, sediment transport, waves, and physical/biological interactions lsanford@umces.edu

SOCIOECONOMIC MODELING

Lisa Wainger, Research Professor (CBL): Ecological and economic modeling, assessment of invasive species, environmental economic indicators wainger@umces.edu

Xin Zhang, Assistant Professor (AL): Earth system models, nitrogen cycling, socioeconomic drivers of global changr xin.zhang@umces.edu

STREAM HEALTH

Katharina Engelhardt, Associate Research Professor (AL): Wetland ecosystem functioning and services, community ecology, aquatic botany kengelhardt@umces.edu

Keith Eshleman,

Professor (AL): Watershed ecology, biogeochemistry of freshwater and groundwater, mathematical modeling of hydrological systems keshleman@umces.edu **Peter Goodwin,** President and Professor: Ecosystem restoration and management of aquatic systems, hydrodynamics modeling; sediment transport and flood risk reduction pgoodwin@umces.edu

Robert Hilderbrand, Associate Professor (AL): Stream conversation, stream health, trout rhilderbrand@umces.edu

Ray Morgan, Professor Emeritus (AL): Ecology of fish, fishery genetics, aquatic pollution ecology rmorgan@umces.edu

MOUNTAINTOP MINING—**Margaret Palmer**, Professor (CBL): Stream community and ecosystem ecology, restoration ecology palmer@umces.edu

TRACE METALS/TOXICOLOGY

Andrew Heyes, Associate Research Professor (CBL): Trace metal geochemistry, contaminant transport, wetlands and aquatic chemistry heyes@umces.edu

Carys Mitchelmore, Associate Professor (CBL): Molecular, biochemical, and cellular responses of organisms to inorganic and organic pollutants; species-specificity; biochemical pathways and toxic effects mitchelm@umces.edu

"Most best management practices—like a riparian buffer or retention pond—only impact a relatively small area You can think about the Clean Air Act as a best management practice that affects every square meter of the watershed."

—Keith Eshleman



"Over time, half of the peeler crabs would die in shedding houses and scientists didn't know why. But in the absence of water quality issues, we found that it's always viruses. An infected crab in your tank of 200 can affect the survivorship."

—Eric Schott



Christopher Rowe, Associate Professor (CBL): Exotoxicology, physiological ecology of animals rowe@umces.edu

Johan Schijf, Associate Professor (CBL): Aqueous biogeochemistry of trace metals schijf@umces.edu WATER QUALITY

William Dennison, Vice President for Science Applications and Professor: Ecology of marine plants, assessing ecosystem health dennison@umces.edu

Michael Gonsior, Assistant Professor (CBL): Diversity of complex organic molecules in aquatic environments analyzed by modern analytical technology gonsior@umces.edu

Lora Harris, Associate Professor (CBL): Systems ecology, primary producers from phytoplankton to macrophytes, ecosystem modeling harris@umces.edu

Sairah Malkin, Assistant Professor (HPL): Sediment biogeochemistry, aquatic microbiology, large lakes and coastal marine systems smalkin@umces.edu

WILDLIFE ECOLOGY

J. Edward Gates, Professor Emeritus (AL): Wildlife and conservation ecology and management, impact of land alteration/connectivity/boundary dynamics egates@umces.edu

John Hoogland, Professor (AL): Evolution of social behavior, wildlife ecology, evolutionary ecology and behavior or prairie dog populations hoogland@umces.edu

ZOOPLANKTON

Hongsheng Bi, Associate Professor (CBL): Population modeling, zooplankton ecology, spatial statistics hbi@umces.edu

James Pierson, Assistant Professor (HPL): Zooplankton ecology, trophic interactions in plankton, climate impacts on plankton jpierson@umces.edu

Louis Plough, Assistant Professor (HPL): Population genetics/ genomics of marine animals, oyster biology and aquaculture, conservation genetics and restoration lplough@umces.edu

Michael Roman, Professor (HPL): Zooplankton ecology, biological oceanograph roman@umces.edu UMCES Center Administration P.O. Box 775 Cambridge, MD 21613 410-228-9250

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