The Center for Coastal Resources Management has a general mission to support informed decision making on resource management issues at all levels of government, including private and corporate citizens.

The Center has specific responsibilities for:

1. providing technical support for the Commonwealth’s tidal wetlands management program, including maintenance of a continuing inventory of the state’s tidal wetlands;
2. maintaining a continuing inventory of the status and trends of tidal shorelines;
3. providing technical support to the Commonwealth’s non-tidal wetlands program;
4. providing technical support on the issue of coastal marine debris; and
5. providing support to the Commonwealth Center for Recurrent Flooding and Resilience.

In addition to these primary and continuing obligations, CCRM has provided continuing involvement in the state’s Coastal Zone Management Program, significant involvement in the Chesapeake Bay Program and its Scientific and Technical Advisory Committee, and significant involvement and official state representation to the Albemarle-Pamlico National Estuary Partnership and its Leadership Council.

At CCRM, we conduct actionable science. Actionable science links science to action with the aim of improving the quality of life for citizens and includes not only information, but also guidance on the appropriate use of that information. This means that our research and expertise helps shape environmental and economic policy decisions. CCRM is providing actionable science towards the goal of resilient and thriving communities, sustainable fisheries, clean water, and healthy productive ecosystems in the Commonwealth.

To fulfill this mission, the Center actively fosters a diverse and inclusive environment to maintain excellence in our research, advisory service, and outreach education. The strength of the Center is based on the diverse interests, perspectives, beliefs, and identities of all of our members, who are committed to the advancement of the William & Mary core values. (link)
PERSONNEL

The Center has a staff of about 25 individuals and supports several graduate students.
**PAMELA BRAFF** completed her PhD program in May 2020; her advisors were Dr. Carl Hershner and Dr. Kirk Havens. She studied the impacts of climate change and sea level rise on coastal eco-systems and communities in the Chesapeake Bay, culminating in a dissertation titled, “Evaluating the Impacts of Land Use and Climate Change on the Hydrology of Headwater Wetlands in the Coastal Plain of Virginia”. She is particularly interested in the application of remote sensing and GIS to improve coastal resource management and decision-making. Some of her projects include mapping hidden wetlands and modeling the impacts of recurrent flooding and sea level rise on coastal road networks. Pamela has taken a position in Washington DC with NOAA’s National Ocean Service, as a Knauss Fellow policy specialist for coastal inundation and resilience.

**NICOLE CAI** earned a Master of Science in Marine Science this year under her advisor, Dr. Joseph Zhang. Her thesis work was on the Impact of Submerged Aquatic Vegetation on Water Quality in Cache Slough Complex, Sacramento-San Joaquin Delta: A Numerical Study. Nicole is continuing her studies at VIMS as a doctoral student working with CCRM’s modeling research program. Some of her current projects include evaluating the impacts of sea level rise on hypoxia in the Chesapeake Bay, building up vegetation models in the Chesapeake Bay, and studying impacts of salt water intrusion on tidal freshwater vegetations.

**AMANDA GUTHRIE** is pursuing her doctorate in Marine Science at VIMS under her advisor Dr. Donna Bilkovic. She researches how living shorelines help support fish communities and mussels in the Chesapeake Bay, and how people make decisions on if and how to mitigate shoreline erosion on their property. Amanda’s work published in the peer-reviewed journal *Wetlands* is titled, “What Drives Property Owners to Modify their Shorelines? A Case Study of Gloucester County, Virginia”. She also authored a chapter on leadership in “Lessons in Leadership: Integrating Courage, Vision, and Innovation for the Future of Sustainable Fisheries.” She finished up three years of service on the VIMS Graduate Student Association Exec team, with two years as Co-President. Amanda is a Co-PI on a SESYNC Graduate Pursuits grant where she is leading seven PhD students on an interdisciplinary research project to understand the social and ecological dimensions of offshore net pen aquaculture in the Gulf of Mexico.

**KARINNA NUNEZ** earned her doctorate in Marine Science at VIMS in April 2020 under her advisor Dr. Carl Hershner. The main focus of her research was coastal modeling. Karinna has extensive expertise in remote sensing and GIS technology used to address local and regional scientific research questions and management applications. Her model outputs inform stakeholders, which help them to develop appropriate planning and management actions. Karinna’s current work for the Center is focused on spatial analysis using GIS technology and remote sensing, cross-scale modeling of creek-river-estuarine-ocean systems, ecology and evolution of tidal marshes, coastal vulnerability assessments due to sea-level rise and flooding, climate change, and sustainable development management in coastal areas.
AWARDS & RECOGNITION

DR CARL HERSHNER retired on April 1, 2020 after 49 years of dedicated service to VIMS. After graduating from VIMS, Carl worked as a shoreline advisor before he joined the VIMS faculty and then launched the Center for Coastal Resources Management in 1999. He leaves behind a long list of field studies, research programs, committees, courses, clinics and advisory service contributions not just in Virginia, but around the world.

THE CARL HERSHNER TEACHING MARSH hosted thousands of visitors who learned about salt marsh ecology, coastal resilience and living shorelines over the past 20 years. It was the vision and support of CCRM’s former Director Carl Hershner that made the teaching marsh so successful. To honor him for all the contributions that he has made to VIMS and the Commonwealth, VIMS recently named this on-campus facility the Carl Hershner Teaching Marsh.

DR KIRK HAVENS (Director) and DR DONNA BILKOVIC (Assistant Director) were named as the new leaders of the Center. They successfully navigated the challenges of teleworking during the COVID-19 pandemic while maintaining a high level of productivity and engaging the Center in discussions on ways we can promote equity and inclusion in our workplace and beyond in their first year. With their combined experiences, the Center is well-equipped to keep working productively into the future.

PAMELA MASON was appointed by Virginia’s Governor Northam to serve on the Soil and Water Conservation Board, which was established by the Virginia General Assembly to help guide the delivery of soil and water conservation services to citizens of the Commonwealth. The Board’s responsibilities include oversight and support of Virginia’s soil and water conservation districts, enforcement of dam safety and floodplain management programs and regulations, and approval of loan criteria for the Dam Safety, Flood Prevention and Protection Assistance Fund.

DR MOLLY MITCHELL and DR JON DEREK LOFTIS were awarded Reveley Faculty Fellowships. Under this fellowship Drs. Mitchell and Loftis will develop and teach an interdisciplinary graduate/undergraduate course, Innovating and Evaluating Collaborative Solutions to Coastal Flooding Resiliency.

DR KIRK HAVENS serves as the Chair of the Leadership Council of the Albemarle-Pamlico National Estuary Partnership (APNEP). APNEP works with the APNEP program office and State agencies to support, evaluate, update, advocate, and guide the implementation of APNEP’s mission.

INTERNS

SADEGH EGHDAMI, a PhD student from the University of Virginia worked with CCRM as part of UVA’s Environmental Resilience internship program. Sadegh tackled the issue of socioeconomics and vulnerable communities, and climate change risk in project titled, “Equity vs Climate Risk”.

MARIA NEOFETOU, a Master of Science in Marine Environmental Management student from the University of York, United Kingdom, worked with CCRM on the impact of derelict blue crab traps in Louisiana. Her dissertation “Examining derelict blue crab trap distributions and their ecological impacts in Louisiana” was completed in October of 2020.

MAYA REESE is a senior at Lafayette High School and the Governor’s School for Science and Technology, who works with Dr. Karinna Nunez for her Senior Research and Mentorship project. She is using GIS technology to study the relationship between shoreline characteristics and submerged aquatic vegetation (SAV) habitats in the Mobjack Bay, VA.
The Center for Coastal Resources Management (CCRM) at VIMS has a formal mission to support informed decision-making on coastal resource management issues from global to local scales. To fulfill this mission, the Center undertakes cross-disciplinary research, provides advisory service, and conducts outreach education. Focus areas of study include:

**ADVISORY**

**ADAPT VA**
Maintain AdaptVA website that serves as a gateway to information for individuals, local programs, and agencies engaged in climate adaptation. Provides legal and policy resources, stories that explain adaption through maps and pictures, and mapping tools that address short and long-term predictions for rising water levels.

**TIDAL SHORELINE MANAGEMENT POLICIES AND PROCEDURES HANDBOOK**
A new website resource to support tidal shoreline decision-making. This digital format replaces the 30 year old Wetlands Management Handbook for local wetlands boards.

**CHESAPEAKE BAY PROGRAM/PARTNERSHIP**
Assist in the science of Chesapeake Bay restoration with staff and faculty membership on CBP committees, goal implementation teams, and workgroups.

**VIRGINIA DEPARTMENT OF TRANSPORTATION**
Develop tools to identify management strategies for road segments subject to current or future flooding by tidal waters and provide a forecast of impacts and mitigation options for transportation infrastructure interaction with coastal ecosystems that provide habitat for fish and wildlife.

**GOVERNOR’S COASTAL RESILIENCE MASTER PLAN**
Assisting the Governor’s Special Assistant for Coastal Adaptation and Protection and the Commonwealth’s Chief Resilience Officer in the development of Virginia’s Coastal Resilience Master Plan.

**EASTERN SHORE DITCHES**
Using GIS and high resolution elevation data, we extracted roadside ditch footprints and then verified the results in the field. This information will help refine predictions of road flooding and inundation by saltwater.

**ASSESSING VULNERABILITY OF PRIVATE WELLS TO FLOODING**
This project provides a spatially explicit well characteristics database.

**EXPANDING VIRGINIA’S OYSTER INDUSTRY WHILE MINIMIZING USER CONFLICT**
Examines potential opportunity for the expansion of aquaculture activity within Virginia’s Chesapeake Bay and proposes alternative strategies for Virginia policy makers.

**PREDICTION OF FUTURE SEPTIC SYSTEM FAILURE SITES (WASTEWATER ISLANDS)**
Analysis of failed septic systems (repair permits) data and locations; Lancaster, Gloucester, Accomack, Northampton, Isle of Wight.
LIVING SHORELINE POLICY
Provide reports on shoreline management outcomes over the past 40 years for Secretary of Natural Resources and DEQ.

SEA LEVEL RISE IMPACTS ON LOCAL TAX BASE
Analysis of physical and socio-economic parcel vulnerability and comparison with property value.

HB1094 (GENERAL ASSEMBLY)
Provide maps and elevation profiles of RPA buffers, elevation contours, and parcel information for a report for Delegate Hodges.

SEA LEVEL RISE REPORT CARDS
Uses Monthly Mean Sea Level (MMSL) data collected from 1969-present for 33 water level sensors in continental US and computes linear and quadratic sea level forecasts with 95% confidence intervals (high and low) from quadratic trends established from data.

WATERSHED IMPERVIOUS COVER MAPS FOR MIDDLE PENINSULA
Uses the most recent version of Virginia’s 6th order National Watershed Boundary Dataset to show the boundaries of each watershed located partially or wholly within the Middle Peninsula planning district localities. The map indicates the percentage of impervious cover within each watershed.

WASTEWATER INFRASTRUCTURE WORKGROUP
Assisting the Deputy Secretary of Natural Resources and the Virginia Department of Health in a multi-agency effort to identify areas of potential septic system failure in the coastal plain and across the state.

EVALUATION OF THE IMPACT OF FLOODING ON ROAD NETWORK ACCESS
Provides flood inundation maps and road network analysis to specific localities.

GARDEN CLUB OF AMERICA COASTAL WETLANDS STUDIES SCHOLARSHIP
Serve as technical review committee for GCA merit-based scholarships that promote wetlands conservation through the support of young scientists in their field work and research.

VIRGINIA MASTER NATURALIST PROGRAM
Serve as sponsoring agency for statewide volunteer program, offer basic training and continuing education for coastal chapters, and provide a chapter advisor for the Middle Peninsula Master Naturalists.

BUILDING A BAY-WIDE SCORECARD TO TRACK CLIMATE RESILIENCE FOR WATERSHED COMMUNITIES
Climate resilience scorecard for communities within the Chesapeake Bay watershed to provide watershed communities with a unified and consistent data-rich method of tracking the implementation and outcomes of policies and actions to improve their climate resilience and compare their progress to others in the region.

CONSERVATION TARGETING FOR RESILIENCE
Developing future projections of likely migratory patterns and abilities of natural habitat and species guilds to shift under climate change and sea level rise.

NEW GUIDANCE TO BUILD RESILIENCY AND MITIGATE FOR SEA LEVEL RISE AS ELEMENTS OF THE CHESAPEAKE BAY PRESERVATION ACT
Developing a guidance document on enforcement of the Chesapeake Bay Preservation Act, in order to integrate adaptations to recurrent flooding with water quality protections afforded by coastal management approaches.

DEEP LENS TECHNOLOGY
Innovation of a new type of water sensor.
DEVELOPMENT OF A STREET-SCALE HYDRODYNAMIC MODEL CALIBRATION AND FUTURE SCENARIOS
Assessed the flooding in the City of Portsmouth under different sea level rise and subsidence scenarios to explore potential storm surge in 2040 and 2075 using actual tropical and extratropical storm events.

TIDEWATCH
Provides a map for the visualization of the magnitude and impacts of coastal flooding within the Chesapeake Bay and along Virginia’s Eastern Shore. The data are generated in 36 hour forecasts each morning and evening and the display is updated twice daily.

DEVELOPMENT OF HIGH-RESOLUTION FLOOD GRIDS FOR GUIDANCE IN BUILDING-LEVEL DAMAGE ASSESSMENTS FOR IFLOWS
Research collaboration between VDEM, the Virginia Institute of Marine Science, and Old Dominion University, to build a dynamic inundation model scenario builder and real-time visualization engine for Salters Creek and Newmarket Creek in Newport News as a demonstration of candidate technologies that may be integrated into VDEM’s IFLOWS system.

VIRGINIA KING TIDE MONITORING VIA SEA LEVEL RISE APP
Coordinates volunteers to collect data annually during Catch the King tidal flooding event using the Sea Level Rise Mobile Application.

STORMSENSE-VIMS, A VIRTUAL MONITORING SYSTEM USING AWS DEEPLENS AI
Commercialize a video camera system that is capable of detecting water level data in real-time, named the StormSense-Video Inundation Monitoring System (StormSense-VIMS).

MARINE DEBRIS

ENGAGING CITIZENS & WATERMEN IN REMOVAL OF DERELICT BLUE CRAB TRAPS IN CHESAPEAKE BAY
Provided a STEM challenge to high school students to develop a CRAB TRAP APP for use by citizens to document derelict blue crab traps. Established a citizen scientist volunteer corps for removal of derelict traps.

TARGETED HOTSPOT REMOVAL OF DERELICT BLUE CRAB TRAPS IN CHESAPEAKE BAY
Employs five commercial watermen to remove derelict blue crab traps from targeted ‘hotspots’ during the closed fishing season.
BIO-HINGE FOR DUNGENESS CRAB TRAPS
Working in Alaska and Washington State using biopolymer technology to mitigate the impact of lost dungeness crab traps.

OTHER MODELING RESEARCH

EVALUATION OF THE DISCHARGE OF BACK RIVER SEWAGE TREATMENT PLANT EFFLUENT TO BALTIMORE HARBOR: PHASES 1 & 2
Assesses the impact of effluent discharges on water quality in the Baltimore Harbor.

IMPLEMENTING SCHISM MODEL AS PART OF NOAA INTEGRATED WATER MODELING PROJECTS
First phase of this NOAA project on the study of compound flooding hazards in eastern and Gulf States.

IMPROVING TIDAL-ESTUARY REPRESENTATION IN MPAS-OCEAN
Involves the coupling of the VIMS SCHISM hydrologic model with the MPAS-Ocean model (Los Alamos National Laboratory) in order to improve modeling in estuaries.

OREGON TSUNAMI HAZARD MITIGATION
Delivered the results on combined tsunami and tidal current to the Oregon Department of Geology and Mineral Industry which has been used in maritime evacuation planning. This year focused on Clatsop and Tillamook counties to account for recent digital elevation updates using existing local and distant tsunami earthquake scenarios to re-model tsunami inundation.

DEVELOPMENT OF AN OPERATIONAL OCEAN PREDICTION MODEL
Building up an operational forecasting system around Taiwan.

EVALUATION OF THE APPLICATION OF OYSTER REEFS IN SHORELINE PROTECTION
Evaluates wave attenuation and shoreline stabilization by US Atlantic and Gulf coast oyster reef living shorelines in collaboration with University of Melbourne and leading researchers in the living shoreline field in the United States.

USING TEMPORARY & SPACIALLY-RICH DATA SETS TO CALIBRATE LINKED HYDRO-BIOCHEMICAL MODELS
Assist Sacramento with their plan for nutrient reduction in the Delta using high resolution observation and 3D model.

DEVELOPMENT OF DATA ASSIMILATION IN OPERATIONAL FORECAST
Development of a data assimilation system for unstructured three-dimensional ocean current model (SCHISM), which includes modification of SCHISM to fully implement the PDAF system in flexible mode, and adapt SCHISM DA code to fit ESMF framework.

ESTABLISHMENT OF A LONG-TERM TIDAL GAUGE
Establishment of a long-term tidal gauge at Crow’s Nest Research Center on Accokeek Creek, a tributary to the Potomac River.
FURTHER DEVELOPMENTS IN SCHISM TO AID THE STUDY OF SAN FRANCISCO BAY & DELTA ECOSYSTEM
To refine several aspects of the SCHISM model algorithms in order to improve simulation results for circulation and ecosystem. In particular, adding a new capability to allow for partial wetting and drying in a cell.

SUPPORTING HIGH RESOLUTION SIMULATIONS OF COMPOUND FLOODING HAZARD FOR JAPAN
Providing a simulation database.

TIDAL SHORELINES & WETLANDS

TIDAL MARSH INVENTORY
Conduct tidal marsh inventory for Essex, Richmond, New Kent, Caroline, Arlington, King William and King and Queen Counties.

TIDAL MARSH INVENTORY CHANGE
Analysis of change between original (1970s) and current tidal marsh inventories.

TIDAL MARSH MODEL
Development of a high-resolution dynamic model of marsh evolution using the SCHISM model framework for hydrodynamic and sediment processes. Model outputs allow coastal planners to more accurately identify the potential future location of marsh habitats where protection and restoration activities can be focused.

TIDAL WETLANDS MANAGEMENT TECHNICAL SUPPORT
The Center provides routine advisories; produces materials for outreach education and newsletters; hosts a website for joint permit application records; and maintains two databases all supporting tidal wetlands management. Shoreline guidance is provided to the general public and decision-makers to support the Commonwealth’s policy preference for living shorelines as erosion control practice.

LIVING SHORELINE SITE SUITABILITY MODEL TRANSFER FOR SELECTED WATER BODIES WITHIN THE GULF OF MEXICO: A GIS & REMOTE SENSING-BASED APPROACH
Provides support to five Gulf Coast regions for running the Shoreline Management Model; including a User Manual for GIS specialists wishing to implement the model in different regions and an interactive Living Shoreline Decision Support Tool.

COASTAL SEES: SUSTAINABILITY IN CHES BAY SHORESCAPES, CLIMATE CHANGE, MANAGEMENT DECISIONS & ECOLOGICAL FUNCTIONS
Investigates the linkages and feedback between human and natural components of Chesapeake Bay shorescapes (a shoreline zone which includes riparian, intertidal, and littoral areas) to inform decision-making for sustainability.

SHORELINE EVOLUTION & LIVING SHORELINE CONTRACTOR TRAINING
Assist the VIMS Shoreline Studies Program with updates for the Living Shorelines Design Guidelines (2017) and provide related shoreline professional virtual training.

www.vims.edu/ccrm/
EXPANDING THE USE OF NATURAL AND NATURE-BASED INFRASTRUCTURE – COASTAL RESILIENCY
Assesses the storm mitigation benefits provided by natural features in the coastal zone, and evaluates the co-benefits those features can provide for other local management objectives. The project develops decision support tools and assesses the exportability of the modeling approach to other coastal states.

SHORELINE EVOLUTION & LIVING SHORELINE CONTRACTOR TRAINING
Assist the VIMS Shoreline Studies Program with updates for the Living Shorelines Design Guidelines (2017) and provide related shoreline professional virtual training.

BUILDING ADAPTIVE SHORELINES & RESILIENT COMMUNITIES IN TIDEWATER VIRGINIA
Assist the James River Association with site selection, design and construction of three living shoreline demonstration projects, conduct three related training workshops, and provide advisory assistance on the content and execution of three Living Shoreline Collaborative Summits for stakeholders in the lower James River.

LIVING SHORELINE SUITABILITY MODEL FOR MARYLAND
Updates the shoreline inventory for selected localities in MD and then uses that data and others to run the Shoreline Management Model in support of MD’s Department of the Environment and their initiative to increase the efficiency for implementation and decision making related to MD’s living shoreline policy along tidal shorelines.

SURVEYING PROPERTY OWNERS FOR RESILIENT COMMUNITIES
A mail survey of property owner’s shoreline modification decisions found that property owners with living shorelines were often more interested in restoring the shoreline, when compared to those with shoreline armoring. Parcels with a high percentage of natural cover or agricultural use are less likely to be modified while parcels with primary structures closer to the shoreline are more likely to have shoreline armoring.

ESTIMATING BLUE CARBON STOCKS IN COASTAL WETLANDS TO ENHANCE NRCS SOIL SURVEYS
Calculates blue carbon stocks in tidal marshes of Virginia and North Carolina from field samples and statistical relationships to enhance NRCS soil surveys.

WETLANDS CONDITION ASSESSMENT TOOL (WetCAT)
Assesses wetland capacity to perform habitat and water quality ecosystem services to inform wetland managers and policy makers on wetland condition. 2019 winner of the Governor’s Technology Award.

SUSTAINING AGRICULTURE IN CHESAPEAKE BAY AT-RISK COASTAL & RIPARIAN LANDSCAPES
Develops a strategy and work plan for technical assistance providers, farmers, land trusts, and local, state, and federal agencies managing farms lands at-risk from rising sea level for conservation and economic outcomes.

DEVELOPMENT OF STRATEGIES TO ENHANCE THE CONSERVATION AND ADAPTATION OF VIRGINIA WETLANDS IN A CHANGING CLIMATE
Provides new marsh maps, inundation maps for field sites, marsh bird surveys, and marsh characteristics inventory

INCREASING USE OF NATURAL & NATURE-BASED FEATURES TO BUILD RESILIENCE TO STORM-DRIVEN FLOODING
The project is focused on increasing the use of natural and nature-based features (NNBFs) to increase resilience of coastal communities to tidal flooding. NNBFs (tidal marsh, nontidal wetlands, beaches, dunes, forest/wooded and living shorelines) are ranked for provision of flooding, water quality and National Flood Insurance credits. Restoration targets are identified for any coastal building lacking benefits from existing NNBFs.

REFINING PROGRAM CAPACITY TO ENHANCE & PROTECT WETLAND RESOURCES IN VIRGINIA
Extends the current online Virginia Wetlands Condition Assessment Tool (WetCAT) to include both tidal and nontidal wetlands as well as nontidal wetlands vulnerable to changing precipitation patterns. Provides for coordinated wetland management by providing comprehensive watershed level maps of wetlands in waterways shared by both Virginia and North Carolina.
Center publications have a world-wide reach with 11783 downloads through ScholarWorks in 2020.

PEER-REVIEWED

**A MULTI-SCALE APPROACH FOR SIMULATING TIDAL MARSH EVOLUTION.** Nunez, K., Zhang, Y., Herman, J., Reay, W., and Hershner, C. (2020). *Ocean Dynamics*, 70(9), 1187–1209. ([link](#))


REPORTS


WEBSITES

The Center website (www.vims.edu/ccrm) had 21273 unique visitors worldwide in 2020.

In addition to the CCRM website, center personnel maintain the ADAPTVA.ORG website.

NEW ONLINE RESOURCES

SHORELINE DECISION SUPPORT TOOL is an interactive tool that combines the utility and ease of the original Decision Trees, the logic of the comprehensive Shoreline Management Model, and the power of the internet to guide the user to a shoreline management alternative that is consistent with the Commonwealth’s preference for a living shoreline. (link)

SHORELINE MANAGEMENT HANDBOOK is a new on-line digital resource to support tidal shoreline decision-making. It contains information on jurisdictions, permits, being on a wetlands board, and much more. The new handbook has replaced the Wetland Management Handbook, a hard copy product that was produced about 30 years ago! (link)
OUTREACH

The Center for Coastal Resources Management (CCRM) staff produced materials for outreach education, and communicated relevant information through talks, workshops, e-newsletters, our website, and social media posts; all supporting actionable science.

PRESENTATIONS

In 2020, Center staff gave talks at more than 60 events in which we reached a combined 7040 people. Some were small individualized trainings or skyping with a scientist while others were large international conferences. These events were mostly virtual this year due to travel restrictions related to Covid-19. CCRM presented on a wide range of topics including everything from climate change, sea-level rise and flooding risk management to marine debris, living shorelines, and bay-friendly gardening. Audiences varied and included the general public; local, state and federal government; other scientists and students of all ages.

WORKSHOPS

CCRM’s annual Tidal Wetlands Workshop was presented this year as a three-part shoreline management webinar series: “Shoreline Decision Support Tools” on Aug 13, “Shoreline Law & Policy Updates” on Aug 20, and “Living Shoreline Performance” on Aug 25. These webinar sessions included presentations and live interaction with shoreline science and policy experts. (link)

E - NEWSLETTERS

CCRM distributes a quarterly e-newsletter which summarizes and communicates current issues that support integrated management of coastal zone resources; announces pertinent publications, programs and events; and points the reader to more detailed information on our website (and others).

- JANUARY 2020 (link)
- APRIL 2020 (link)
- JULY 2020 (link)
- SEPTEMBER 2020 (link)

SOCIAL MEDIA

CCRM increased our social media effort as another approach to inform the public about coastal issues in Virginia with the ultimate goal of building relationships within our local community. You can now follow us on Facebook, LinkedIn, YouTube, and Instagram.

- VIDEO: BIODEGRADABLE NETTING. Dr. Kirk Havens gets all tangled up in a light-hearted description of the serious problems posed by plastics in the environment, and explains how his collaborative efforts to develop biodegradable netting could benefit wildlife and help reduce emissions of methane—a potent greenhouse gas. (link)
- VIDEO: ADAPTVA. VIMS emeritus professor Carl Hershner shares two cutting-edge tools developed by scientists in the Center to predict sea level—in the next 36-hours (Tidewatch Map) and the next 80-100 years (Sea-Level Rise Viewer). These tools benefit a wide range of users, from waterfront homeowners to first responders, watermen, boaters, and planners at the local and state level. (link)
INSTITUTIONAL PARTNERS

GOVERNMENT AGENCIES

ACCOMACK-NORTHAMPTON PLANNING DISTRICT COMMISSION
ALABAMA GEOLOGICAL SURVEY
CALIFORNIA DEPARTMENT OF WATER RESOURCES
CENTRAL WEATHER BUREAU - TAIWAN
COLONIAL SOIL AND WATER CONSERVATION DISTRICT
COMMONWEALTH OF VIRGINIA
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL HIGHWAYS ADMINISTRATION
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FRENCH EMBASSY
HAMPTON ROADS PLANNING DISTRICT COMMISSION
JAMES CITY COUNTY
MARYLAND DEPARTMENT OF THE ENVIRONMENT
MARYLAND DEPARTMENT OF NATURAL RESOURCES
MIDDLE PENINSULA PLANNING DISTRICT COMMISSION
NOAA – CHESAPEAKE BAY OFFICE
NOAA – FISHERIES AUKE BAY LABORATORIES
NOAA – MARINE DEBRIS PROGRAM
NOAA – MIDATLANTIC REGIONAL INTEGRATED SCIENCES AND ASSESSMENTS
NOAA – NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM
NOAA – NATIONAL OCEAN SERVICE BEAUFORT LAB
NOAA – NATIONAL WATER CENTER
NOAA – OFFICE OF COAST SURVEY
NOAA – OFFICE FOR COASTAL MANAGEMENT
NOAA – RESTORE SCIENCE PROGRAM
NOAA – SEA GRANT
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NATIONAL FISH AND WILDLIFE FOUNDATION
NATIONAL SCIENCE FOUNDATION
NATIONAL WILDLIFE FEDERATION
NATIONAL RESOURCES CONSERVATION SERVICE
NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTH CAROLINA NATIONAL ESTUARINE RESEARCH RESERVE
NORTH CAROLINA OFFICE OF RECOVERY AND RESILIENCE
NORTHERN NECK PLANNING DISTRICT COMMISSION
MARYLAND DEPARTMENT OF ENVIRONMENT
SOIL AND WATER CONSERVATION DISTRICT
US ARMY CORPS OF ENGINEERS - RESEARCH AND DEVELOPMENT CENTER
US ARMY CORPS OF ENGINEERS - INSTITUTE FOR WATER RESOURCES
US DEPARTMENT OF DEFENSE
US ENVIRONMENTAL PROTECTION AGENCY
US FISH AND WILDLIFE SERVICE
US GEOLOGICAL SURVEY
VIRGINIA COASTAL ZONE MANAGEMENT PROGRAM
VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION
VIRGINIA DEPARTMENT OF EDUCATION
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
VIRGINIA DEPARTMENT OF TRANSPORTATION
VIRGINIA GEOGRAPHIC INFORMATION NETWORK
VIRGINIA MARINE RESOURCES COMMISSION
VIRGINIA SECRETARY OF NATURAL RESOURCES
VIRGINIA SPECIAL ASSISTANT TO THE GOVERNOR ON COASTAL RESILIENCE

UNIVERSITIES / INSTITUTES

CHESAPEAKE BAY NATIONAL ESTUARINE RESEARCH RESERVE
DAUPHIN ISLAND SEA LAB
DUKE UNIVERSITY
EAST CAROLINA STATE
GEORGE MASON UNIVERSITY
GORDON COLLEGE
HAMPTON UNIVERSITY
INSTITUTE OF MOLECULES AND MATERIALS OF LE MANS - FRANCE
LOUISIANA STATE UNIVERSITY AGRICULTURAL CENTER
MISSISSIPPI STATE UNIVERSITY
NATIONAL CHENG KUNG UNIVERSITY - TAIWAN
OLD DOMINION UNIVERSITY
PENNSYLVANIA STATE UNIVERSITY
RUTGERS UNIVERSITY
SMITHSONIAN ENVIRONMENTAL RESEARCH CENTER
TROY UNIVERSITY
UNIVERSITY OF CENTRAL FLORIDA
UNIVERSITY OF DELAWARE
UNIVERSITY OF GEORGIA
UNIVERSITY OF LA ROCHELLE - FRANCE
UNIVERSITY OF MAINE
UNIVERSITY OF MELBOURNE - AUSTRALIA
UNIVERSITY OF NEW ORLEANS
UNIVERSITY OF SOUTH ALABAMA
UNIVERSITY OF TASMANIA - AUSTRALIA
UNIVERSITY OF VIRGINIA
UNIVERSITY OF WASHINGTON
VIRGINIA SEA GRANT
VIRGINIA TECH
WAGENINGEN UNIVERSITY AND RESEARCH - THE NETHERLANDS
WATER INSTITUTE OF THE GULF
WILLIAM & MARY - CENTER FOR CONSERVATION BIOLOGY
WILLIAM & MARY - CENTER FOR GEOGRAPHIC INFORMATION AND ANALYSIS
WILLIAM & MARY - KECK ENVIRONMENTAL FIELD LABORATORY
WILLIAM & MARY - VIRGINIA COASTAL POLICY CENTER

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NON-GOVERNMENT ORGANIZATIONS

ABT ASSOCIATES
ALBEMARLE-PAMILICO NATIONAL ESTUARY PARTNERSHIP
AMERICAN SHORE AND BEACH PRESERVATION ASSOCIATION
CHESAPEAKE BAY FOUNDATION
CHESAPEAKE BAY PROGRAM
CHESAPEAKE BAY TRUST
CHESAPEAKE RESEARCH CONSORTIUM
FRIENDS OF THE RAPPAHANNOCK
GALVESTON BAY FOUNDATION
GARDEN CLUB OF AMERICA
HELMHOLTZ-ZENTRUM GEESTHACTHT - GERMANY
JAMES RIVER ASSOCIATION
NATIONAL WILDLIFE FEDERATION
NATURAL RESOURCES CONSULTANTS, INC
NORTH CAROLINA COASTAL FEDERATION
OSTER RESTORATION PARTNERSHIP
PARTNERSHIP FOR DELAWARE ESTUARY
PONTCHARTRAIN CONSERVANCY
RAND CORPORATION
RAPPAHANNOCK RIVER BASIN COMMISSION
SITKA SOUND SCIENCE CENTER
THE CONSERVATION FUND
THE NATURE CONSERVANCY
THE ELIZABETH RIVER PROJECT
VIRGINIA EXTENSION MASTER GARDENERS - GLOUCESTER
VIRGINIA EXTENSION MASTER GARDENERS - HAMPTON
VIRGINIA EXTENSION MASTER GARDENERS - NORTHERN NECK
VIRGINIA EXTENSION MASTER GARDENERS - YORK/POQUOSON
VIRGINIA MASTER NATURALISTS - HISTORIC RIVERS
VIRGINIA MASTER NATURALISTS - HISTORIC SOUTHSIDE
VIRGINIA MASTER NATURALISTS - MIDDLE PENINSULA
VIRGINIA MASTER NATURALISTS - NORTHERN NECK
VIRGINIA MASTER NATURALISTS - PENINSULA
VIRGINIA MASTER NATURALISTS - RIVERINE
VIRGINIA MASTER NATURALISTS - TIDEWATER
WETLANDS WATCH
YORK RIVER AND SMALL COASTAL BASIN ROUNDTABLE