

**APPROVAL OF REVISIONS TO THE  
VIRGINIA INSTITUTE OF MARINE SCIENCE'S 2022-2028 SIX-YEAR PLAN**

**WHEREAS**, the Commonwealth of Virginia requires public colleges and universities submit a six-year plan approved by its Board of Visitors by October 1 of each odd numbered year and to provide revisions to the plan, if approved by the Board of Visitors, in each even numbered year;

**WHEREAS**, the Commonwealth of Virginia requires the administration of each college and university to provide a draft plan or draft revisions in advance of the final submission in July of each year; and

**WHEREAS**, in response to the Commonwealth's direction that the Virginia Institute of Marine Science (VIMS) prepare a separate Six-Year Plan from William & Mary;

**THEREFORE, BE IT RESOLVED** that upon recommendation of the President, the Board of Visitors approves the VIMS 2022-2028 Revised Six-Year Plan in accordance with the requirements of the Higher Education Opportunity Act of 2011 and subsequent guidance from the State Council of Higher Education for Virginia.

*\*Clean version attached, redline sent as pre-read*

**2021 SIX-YEAR PLAN NARRATIVE (Part II); updated 7.11.22****INSTITUTION:** Virginia Institute of Marine Science**OVERVIEW**

The totality of the six-year plan should describe the institution's goals as they relate to state goals found in the *Pathways to Opportunity: The Virginia Plan for Higher Education*; the Higher Education Opportunity Act of 2011 (TJ21); and the Restructured Higher Education Financial and Administrative Operations Act of 2005.

The instructions under institutional mission and alignment to state goals, below, ask for specific strategies, in particular related to equity, affordability and transformative outcomes. Other sections will offer institutions the opportunity to describe additional strategies to advance institutional goals and state needs. ***Please be as concise as possible with responses and save this narrative document with your institution's name added to the file name.***

**SECTIONS**

**Section A. Pandemic Impact:** Briefly discuss, in one to two paragraphs, how the pandemic has impacted your institution. What things did your institution already have in place that proved helpful? What lessons were learned? What short-term changes have been made? What long-term changes will be made? What are the concerns moving forward?

**RESPONSE:**

The Virginia Institute of Marine Science has a non-residential campus with no dorms, dining halls, sports facilities or visitor centers. Impacts from the pandemic were therefore not tied to undergraduate education, but rather to graduate education (~90 students) and most notably to the field and laboratory research that underpins all three parts of the VIMS mission. The primary challenges were (1) moving quickly with little warning to teleworking, ensuring insofar as possible that students were able to continue to meet milestones, (2) developing protocols for conducting research in both laboratory and field settings while maintaining social distancing requirements, (3) meeting deliverables on federal and state grants because of research restrictions and uncertainty regarding opportunities for grant renewals and new grant submissions and, most recently, (4) implementing a plan for returning primarily to an in-person institution given that some employees have been working remotely for nearly 16 months. There are no anticipated long-term institutional changes as a result of the pandemic, and the most important lesson was the need for and great benefit from consistent, timely, and accurate COVID-related messaging to the VIMS community.

**Section B. Institutional Mission, Vision, Goals, Strategies, and Alignment to State Goals:** Provide a statement of institutional mission and indicate if there are plans to change the mission over the six-year period.

Provide a brief description of your institutional vision and goals over the next six years, including numeric targets where appropriate. Include specific strategies (from Part 3 – Academic-Financial Plan and Part 4 – General Fund Request) related to the following state themes and goals:

- **Equitable:** Close access and completion gaps. Remove barriers to access and attainment especially for Black, Hispanic, Native American and rural students; students learning English as a second language; students from economically disadvantaged backgrounds; and students with disabilities.
- **Affordable:** Lower costs to students. Invest in and support the development of initiatives that provide cost savings to students while maintaining the effectiveness of instruction.

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- **Transformative:** Expand prosperity. Increase the social, cultural and economic well-being of individuals and communities within the Commonwealth and its regions. This goal includes efforts to diversify staff and faculty pools.

Strategies also can cross several state goals, notably those related to improved two-year and four-year transfer, and should be included here. If applicable, include a short summary of strategies related to research. The description of any strategy should be one-half page or less in length. Be sure to use the same short title as used in the Part 3 and Part 4 worksheets. If federal stimulus funds will fund activities and are included in Part 3 as reallocations, please note how they will be used.

**RESPONSE:**

The Mission of the Virginia Institute of Marine Science is to seek and broadly communicate knowledge in marine and coastal science to the Commonwealth of Virginia, the nation, and the world through research, education, and advisory service.

As a nationally and internationally recognized premier marine science institute, our overarching goals in the VIMS Vision are to (1) make seminal advances in understanding marine and coastal systems through research and discovery, (2) translate research findings into practical solutions to complex issues of societal importance, and (3) provide new generations of researchers, educators, problem solvers, and managers with a marine-science education of unsurpassed quality.

**Increase Base Operating Support**

The normal formulas used by the state to assess and provide base operating support to higher education institutions puts VIMS at a significant disadvantage. In addition, whereas the state funding we receive for specific initiatives remains flat through time, our cost of producing the science and providing associated deliverables increases annually, particularly during inflationary periods such as the one we are in at present. This request includes vital institutional support for core operational functions that ensure that we can continue to meet the scientific and advisory service needs of the Commonwealth efficiently and effectively.

**Sustain VIMS' World-Class, Advanced Breeding Program for Shellfish**

Virginia is a national leader in aquaculture production of clams and oysters. These developments have been rooted in scientific advances and transfer of contemporary technologies to the industry by VIMS. In fact, VIMS has become a world leader in shellfish aquaculture technologies. Advances made by VIMS in this area include the development and maintenance of disease-resistant, fast-growing oyster strains and tetraploid oysters used by industry to produce sterile triploid oysters that can be marketed year-round. Current grant funded research is allowing VIMS to develop advanced genomic selection technologies that will further revolutionize our ability to produce even better strains of oysters. Virginia's oyster aquaculture industry is based almost entirely on the use of these selected oyster strains and VIMS' ability to continually develop improved strains. Current operations in this area funded through a mix of E&G funds, royalty fees paid by industry, and research grant funds. The latter of these sources suffices to make scientific advances in breeding technologies, but they are not sufficient to operationalize those advances in support of industry. Additional E&G base funding is needed to ensure that VIMS and Virginia can maintain its national and international leadership in this valuable industry.

**Establish Virginia Harmful Algal Bloom (HAB) Monitoring Consortium.** Harmful algal blooms pose a significant threat to human and animal health, as well as to aquaculture, commercial fisheries, aquatic food webs and safe recreational water use. Recent increases in the frequency, severity and distribution of algal blooms have occurred worldwide and the threats posed by emerging HAB species are predicted to increase. Specifically, in Virginia's waters there are emerging HABs, as well as increases in the severity and distribution of several harmful species. Additional coordinated and intensive monitoring

efforts are needed to gain a better understanding of the conditions that lead to blooms of HAB organisms and to more accurately predict the potential human health effects and impacts on aquatic life.

Virginia citizens would be best served by a HAB monitoring consortium where VIMS personnel would work cooperatively with other Virginia state agencies, particularly the Virginia Department of Environmental Quality (DEQ), Virginia Marine Resources Commission (VMRC) and the Virginia Department of Health (VDH). This consortium would coordinate a larger-scale HAB monitoring program in Virginia waters, engage in public education, and develop appropriate response and notification protocols for future HAB events. Currently the stations in VA estuarine and marine waters are typically monitored only monthly and more frequent monitoring is necessary, particularly during the peak bloom season of summer and early fall. More frequent monitoring is particularly important for shellfish growing areas where there is a risk to human and shellfish health. The role of VIMS scientists in this consortium would be species and toxin identification and quantification.

**Enhance the sustainability and productivity of Virginia's shellfish aquaculture industry**

Shellfish aquaculture is one of the fastest growing economic drivers in coastal Virginia, especially in rural areas. With this growth has come the need for new monitoring and assessment programs to protect human health and maximize the industry's productivity. We propose to establish three monitoring programs that will enhance the productivity and sustainability of this valuable industry in Virginia: 1) Monitor for the presence of the human pathogenic bacteria *Vibrio* species and establish links to environmental factors that lead to risk reduction; 2) Determine the carrying capacity (optimal amount of shellfish can be grown in a particular water body) for shellfish growing areas throughout Virginia's tidal waters; and 3) Expand our network of monitoring sites for coastal acidification and develop warnings systems and protocols to assist commercial shellfish hatcheries to mitigate the impacts of low pH in coastal waters. Federal grant funding, which we employ with great success in supporting our research programs, is typically not available to support such monitoring programs. State support in monitoring programs will allow us to meet the needs that have been expressed by industry.

**Monitor Zooplankton and Larval Fish.** Zooplankton (small marine organisms) serve both as trophic links between primary producers and higher trophic levels—such as commercially important fish and invertebrates. Furthermore, most commercially important fish and all shellfish in Chesapeake Bay have a pelagic, larval stage in the plankton—the survival of which exerts key control on the fisheries stock. However, for the past two decades there has been no systematic sampling of spatial and temporal variability in zooplankton or fish larval abundance in Virginia waters. The Commonwealth's current water quality monitoring programs and fisheries stock assessments completely exclude this key link in the estuarine and coastal food web. Indeed, predictive models of Bay water quality and fisheries stocks—if they include mid-trophic levels at all—are based on obsolete zooplankton data. Rising temperatures and changing salinity distributions in the Chesapeake Bay are certain to alter this important link in the food web.

With the Commonwealth's significant investment in the new R/V *Virginia*, recent upgrades and digitization of the Nunnally Ichthyology larval fish collection, and the wide expertise of faculty members including plankton and benthic ecology, ichthyology, and ecosystem modeling, VIMS is now uniquely poised to address this critical gap in our understanding of Bay and coastal food web dynamics. Recent advances in remote observation technology using an Underwater Vision Profiler and machine learning have also increased efficiency of zooplankton sampling, identification, and enumeration. This initiative will complete our fisheries monitoring program.

**Establish a Molecular Core Lab.** Rapidly advancing technology has led to a revolution in the realm of molecular biology and genomics, giving scientists much greater power to address complex problems

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in marine and estuarine systems. This revolution offers the opportunity for VIMS to improve its capabilities in fulfilling its advisory mission to the Commonwealth in the areas of fisheries and aquaculture, environmental health, and coastal ecology. Extremely large amounts of data can be generated in a relatively short period of time using this technology, offering unparalleled opportunities to create more sustainable environments, bolster regional economies, and protect human health.

Currently, VIMS researchers within three different departments use molecular approaches to address important research questions related to resource management and public health issues in Virginia, including fisheries and aquaculture management, harmful algae blooms, and shellfish health and safety. Key pieces of heavily used shared equipment are scattered across campus and are rapidly becoming outdated. VIMS' ability to accommodate this research, which requires massively high-throughput sequencing, digital PCR, transcriptomics and single cell genomics, is limited by the absence of a centralized facility with support.

We are seeking to upgrade critical instruments and to add technical expertise in advanced bioinformatics analyses, and dedicated technical staff to operate and coordinate the use of specialized equipment, and to advise researchers on appropriate strategies and approaches to answer their research questions. Almost all top-tier marine research institutions, including Woods Hole Oceanographic Institute, Scripps Institution of Oceanography, Rosenstiel School at University of Miami, University of Rhode Island, University of Washington, and others, support these types of core facilities with state-of-the-art equipment and technical expertise. As VIMS is in the process of designing and building a new science laboratory building, it is an excellent opportunity to acquire the needed equipment and additional staff to develop the molecular capabilities to remain competitive in the 21<sup>st</sup> Century and to provide the Commonwealth with state-of-the-art, science-based advice. VIMS has leveraged its existing molecular genetics capabilities for over \$5M in extramural research funds. Enhancing our capabilities further would expand our capacity to leverage even more extramural money in support of our research, education and advisory missions.

**Expanding VIMS' public presence and impact**

Over the next six years VIMS is committed to maximizing the influence of our science in the estuarine environments and coastal communities that need it the most. We are also committed to increasing our visibility, expanding our community engagement, broadening our public education, and developing more robust pipelines for future marine scientists from a variety of backgrounds. VIMS is exploring how best to meet these ambitious goals in communities along the Virginia coastline.

**Continue to Operate as a Year-round Facility.** As an independent state agency that is heavily involved in research and graduate education, VIMS also provides advisory service to the Commonwealth in the form of expert scientific advice on marine-related issues throughout Chesapeake Bay and the coastal ocean. All three of our missions, the graduate program, research and advisory programs, are heavily operational for the entire 12-month calendar year, and in fact, all of our faculty hold 12-month appointments. Field research is most active between April and October, but most other activities occur equally throughout the year. VIMS always has been, and will continue to be, a year-round operation.

**Section C. In-state Undergraduate Tuition and Fee Increase Plans:** Provide information about the assumptions used to develop tuition and fee information the institution provided in the Excel workbook Part 1. **The tuition and fee charges for in-state undergraduate students should reflect the institution's estimate of reasonable and necessary charges to students based on the institution's mission, market capacity and other factors.**

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Not Applicable

**Section D. Tuition and Other Nongeneral Fund (NGF) Revenue:** Provide information about factors that went into the calculations of projected revenue, including how stimulus funds may mitigate tuition increases.

**RESPONSE:**

Not Applicable

**Section E. Other Budget Items:**

**RESPONSE:**

Not Applicable

**Section F. Enrollment Projections:** Include in this section information about how your institution developed its enrollment projections, whether your institution is concerned about future enrollment trends, and, if so, what planning is underway to address this concern. How have enrollment plans been impacted by the pandemic? For example, does your institution plan on enrolling more online students?

**RESPONSE:**

Not Applicable

**Section G. Programs and Instructional Sites:** Provide information on any new academic programs, including credentials and certificates, new instructional sites, new schools, or mergers supported by all types of funding, that the institutions will be undertaking during the six-year period. Note that as part of the revised SCHEV program approval process, institutions will be asked to indicate if a proposed new program was included in its six-year plan. Also, provide information on plans to discontinue any programs.

**RESPONSE:**

Not Applicable

**Section H. Financial Aid:** Discuss plans for providing financial aid, not including stimulus funds, to help mitigate the impact of tuition and fee increases on low-income and middle-income students and their families, including the projected mix of grants and loans. Virginia's definitions of low-income and middle-income are based on HHS Poverty Guidelines. A table that outlines the HHS guidelines and the definitions is attached.

**RESPONSE:**

Not Applicable

**Section I. Capital Outlay:** Discuss the impact, if any, that the pandemic has had on capital planning, such as decreasing the need for space or other aspects. Provide information on your institution's main Education and General Programs capital outlay projects, including new construction as well as renovations that might be proposed over the Six-Year Plan period that could have a significant impact on strategies, funding, student charges, or current square footage. Do not include projects for which construction (not planning) funding has been appropriated. *Special Note: The requested information is for discussion purposes only and inclusion of this information in the plans does not signify approval of the projects.*

**RESPONSE:**

**Construct New Fisheries Science Building.** This request supports the construction of a new 38,000 square-foot state-of-the-art research laboratory building to replace the 34-year-old Nunnally/Fisheries Science Laboratory. It will include a fish processing laboratory, climate-controlled storage and faculty research offices and laboratories supporting the Department of Fisheries Science. The new building will consolidate the Fisheries Science Department into one location, improving the colloquy between

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faculty, staff and students of the department. Additionally, space for the Nunnally Ichthyology Collection (Fish Collection Museum) will serve as the largest repository for freshwater, Chesapeake Bay and coastal fishes of Virginia. The building will be required to meet LEED Silver design standards, at a minimum. The total cost for this project is estimated at \$48.6M.

**Construct Marine Operations Administration Complex.** This request supports the construction of a new 12,000 square-foot marine operations facility to replace several existing structures. The facility will be constructed with a raised elevation that will take into consideration sea level rise and will consist of offices for the department's administrative staff, a training/instruction classroom, a workshop to support the dive equipment program, a maintenance repair shop to support the marine operations equipment repair program, and field and equipment storage. This project also includes the expansion and modifications to the boat basin to allow to berth the R/V *Virginia*. The new Marine Operations Administration Complex completed a feasibility study to analyze the current program needs and will be designed to meet LEED Silver standards, at a minimum. The total cost for this project is estimated at \$23M.

**Section J. Restructuring:** Provide information about any plans your institution has to seek an increased level of authority, relief from administrative or operational requirements, or renegotiation of existing management agreements.

**RESPONSE:**

Not Applicable

**Section K. Evaluation of Previous Six-Year Plan:** Briefly summarize progress made in strategies identified in your institution's previous six-year plan. Note how additional general fund support and reallocations were used to further the strategies.

**RESPONSE:**

The following priorities were funded with the recently approved FY 22-23 budget:

- *Operating costs for new facilities coming online in FY 23: \$617,307*
- *Support the Commonwealth Fisheries Collection in FY 23: \$209,098*
- *Support the Implementation of the Virginia Coastal Resiliency Master Plan in FY 23: \$424,827*
- *Establish an Underrepresented Minority Postdoctoral Research Associate Program in FY 23: \$411,594*

**Section L. Diversity, Equity and Inclusion (DEI) Strategic Plan:** Provide an update on the completion status of your institution's plan that is being coordinated with the Governor's Director of Diversity, Equity and Inclusion. If a copy of the plan is available, please include it when your institution submits its initial plan. If a copy of the plan is not available for July 1 or if changes are made, please provide a copy with your institution's final plan submission on October 1.

**RESPONSE:**

Although William & Mary will be submitting the University's DEI Strategic Plan that includes VIMS, below are highlights of VIMS-specific initiatives:

- Engaged with Norfolk State University (NSU) to set up a collaboration around the ecological health and restoration of the Elizabeth River. This collaboration includes establishing student internships for NSU students, formalizing research partnerships in the Elizabeth River, and

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evaluating environmental justice issues associated with risks from contaminants in the river and its watershed.

- Helped the Pamunkey Indian Tribe to submit a grant proposal to the Bureau of Indian Affairs for a comprehensive review of the surface and groundwater resources on and in the vicinity of their reservation. If funded, VIMS will work with tribal members to conduct the study by developing a comprehensive tidal wetland management plan. VIMS has also worked with the Pamunkey Indian Tribe in the past to submit a proposal to the Environmental Protection Agency.
- Along with Old Dominion University, planned the 24th annual Blue Crab Bowl that was held virtually in February 2021 where 16 teams from Virginia high schools displayed their mastery of oceanic knowledge. The virtual platform provided expanded access to schools who may not have been able to participate in the past due to costs, particularly transportation and lodging.

**Section M. Economic Development Annual Report:** Provide a copy of any report your institution has produced about its economic development contributions.

**RESPONSE:**

In June 2018, Gloucester County produced a video promoting economic development that featured, in one segment, its relationship with VIMS under the heading “where inquiring minds come to learn.” VIMS is one of the county’s economic drivers and maintains a strong relationship with the Director of Economic Development, always with an eye towards mutually-beneficial partnerships.

VIMS is located in GO Virginia Region 6, and the VIMS Dean and Director is a voting member of the Region’s Council. Virginia Sea Grant (VASG), which is headquartered at VIMS and composed of six Virginia R1 universities, was awarded a \$2.9M GO Virginia state grant (Region 6 in partnership with Region 5 – Hampton Roads) to launch a coastal resilience and adaptation economy. Requiring collaboration with the private sector and enhanced university public-private partnership R&D capacity, this effort aids in positioning Virginia to be a global leader in coastal adaptation products, technologies, designs and services. This 2021-23 project is estimated to spur \$95.7M in economic activity and return \$2.48 tax dollars to the Commonwealth per grant dollar by Year 5. In addition, working with multiple universities, VASG produced \$7.5M in economic benefits in 2020, including over \$1.3M from a VIMS-W&M-ODU-VT collaboration to support aquaculture companies’ expansion of direct marketing and sales strategies after COVID-19 shut down their restaurant markets, as well as over \$880K for a VIMS and VT effort to expand catfish electrofishing technologies and processing capacity in Virginia.

***State industries to which the institution’s research efforts have direct relevance***

There are several industries in which VIMS’ research efforts have had a direct impact. Examples include:

- ***Oyster and Clam Aquaculture Industry.*** In 2017, the farm gate value for Virginia’s shellfish aquaculture industry was \$56.6 million, of which \$38.1M was attributed to Hard Clams and \$18.5M to Oysters. This is an all-time high for the shellfish aquaculture industry. The research conducted at VIMS by our faculty and staff over the last 50 years has led to this economic success. Specifically, VIMS researchers provide genetically superior oyster brood stock to industry without charge, and provide guidance to industry on the leading diseases that impact shellfish to provide guidance to industry.
- ***East Coast Off Shore Scallop Industry.*** In the early 1990s, the scallop fishery along the U.S. Atlantic seaboard was on a sharp downward slide. Commercial fishermen were having to spend more and more time at sea, up to 240 days per year, but were catching fewer and smaller scallops. Today, that fishery is the second most valuable commercial fishery on the East Coast, with more than \$400 million in scallops landed in 2014. Virginia alone unloaded



\$33.6M in scallops in that year, generating an additional \$21M in economic activity in the Commonwealth for a total impact of over \$50M. A large part of the recovery and growth of the East Coast scallop fishery is due to a long-term collaboration between scallopers, fishery managers, and scientists at VIMS. Our scientists have spent thousands of days on commercial scallop boats and research vessels during the last decades, testing and refining dredge equipment to maximize sustainable scallop harvests while minimizing bycatch of yellowtail flounder and sea turtles.

- *Agriculture Industry.* The Eastern Shore of Virginia is home to tomato farms and, increasingly, chicken farms. VIMS' researchers work with the state and local municipalities to understand the potential impacts of these industries on water quality, and assist in developing mitigation strategies to reduce the impacts.
- *Environmental Industry.* VIMS researchers developed state-of-the-art biosensors that have early detection functionality for oil spills, rapid quantification in real-time of polycyclic aromatic hydrocarbons (PAHs) concentration (EPA considers PAHs highly toxic and lists 17 as suspected carcinogens), and other contaminants. Data from these biosensors have been used guide sediment remediation in the Elizabeth River in real-time, thus avoiding additional unintended environmental damage.

***High-impact programs designed to meet the needs of local families, community partners, and businesses***

- *Oyster Aquaculture Training Program.* The Oyster Aquaculture Training program is a popular five-month hands-on program that focuses on the principles of oyster aquaculture. Participants learn and work alongside researchers during our oyster hatchery season from April to August. They receive a stipend for the duration of their involvement. To ensure a one-on-one experience, we accept a maximum of only 3-5 participants. During the five-month program, participants rotate through various stages of oyster aquaculture, from our hatchery and field grow-out operations, to our laboratory. Working through these rotations provides a sound understanding of all phases of the oyster life-cycle. Participants also work in the field, learning the importance of seawater flow rates, sieve and bag sizes, and oyster seed sizes and densities. They learn various field grow-out methods, such as suspended culture and rack and bag techniques. By the end of the program, participants have a clear understanding of all areas of oyster aquaculture and are highly qualified and confident in their ability to perform tasks in both oyster hatchery and field operations. Although there are only a small number of participants in any given year, the impact of the program is high and community and industry relations are enhanced.
- *Community Outreach.* VIMS and its federal partners offer a wide variety of free public programs both on VIMS' campuses in Gloucester Point and Wachapreague, as well as throughout Hampton Roads and the lower Chesapeake Bay region. VIMS has offered more than 280 outreach programs that reached more than 21,000 citizens. Our programs include After Hours Lecture Series, Discovery Labs, Annual Open Houses at Gloucester Point and Wachapreague, Public Tours, Seafood Symposia, Speakers Bureau, Technical Training and Workshops, Summer Camps for K-8<sup>th</sup> graders, Field and Classroom Experiences, and booths at local Fairs and Festivals.

***Business management/consulting assistance***

As the state's mandated advisor on a wide range of natural resources management and use issues, VIMS plays a truly unique role as an institution of higher education. In fact, VIMS is a model for the nation in this regard because our advisory services mission is so significantly different from traditional university service to the community, and it shapes VIMS in a most fundamental way. VIMS is identified in 40 sections of the *Code of Virginia*, and as such we are on call and expected to provide advice based on the highest quality science when requested by the Governor, the

General Assembly, state agencies, marine industries, and citizens. The charge put forth to us in the *Code of Virginia* is an asset, an advantage, and a vibrant part of our institutional culture. Advisory service is in many ways the public face of VIMS.

Currently, there are over a dozen major projects ranging from municipal surface water intakes, to the Chesapeake Bay Bridge Tunnel and Hampton Roads Bridge Tunnel expansions, to Dominion Energy's Offshore Commercial Wind Energy project on which VIMS is providing science-based advice to industry and permitting agencies. Expectations from stakeholders are high and we have a long history of furnishing advice of unsurpassed quality. Many of these projects require multiple permits and are complicated, time-consuming and often controversial. VIMS brings, at no charge, an objective voice that ultimately results in better policy and management decisions, and that help sustain the environment and protect public health.

The Commonwealth Center for Recurrent Flooding Resiliency (CCRFR), a partnership between Old Dominion University, W&M Law School's Virginia Coastal Policy Center (VCPC) and VIMS, was established in 2016 to bring university-based expertise to the growing challenge of recurrent flooding. The CCRFR conducts studies, provides training and offers a variety of services in the area of recurrent flooding resilience, and is currently working with local governments and state and federal agencies throughout Tidewater Virginia to enhance the region's resiliency to flooding. Examples include: 1) working with the City of Virginia Beach to assess resilience in the tourism industry and assemble policy recommendations; 2) collaborating with Newport News, Hampton and Norfolk to install low cost-water level-monitors to enhance prediction and visualization tools; 3) assisting the City of Portsmouth in incorporating resilience to future storms in their comprehensive plan; 4) evaluating the effectiveness of various risk communication methods; 5) mapping local land subsidence rates; 6) contributing to the development of easy-to-use data portal, *Adapt Virginia*, that provides a wide range of technical and policy decision support for building resilience; 7) providing leadership in addressing storm water concerns in rural Tidewater, and; 8) developing an improved version of *TideWatch*, which currently predicts water levels at selected tide gauge stations 36 hours in advance, and will soon provide flood inundation predictions up to 48 hours in advance.