THE HEALTH OF THE WORLD'S COASTAL ECOSYSTEMS IS FUNDAMENTAL TO OUR SURVIVAL.

That's Where We Come In ...











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As coastal populations grow, the problems affecting coastal and estuarine systems intensify. At VIMS, the knowledge we gain from our studies in Chesapeake Bay and other waters benefits aquatic ecosystems and coastal residents both here in America and throughout the world.

The need for research will never end. And if we're careful, neither will the benefits that come with healthy waters.



"Virginia has invested for more than 70 years in building a world-class scientific institution that serves its citizens, our nation and the world."

- Dr. John Wells

THE VIMS MISSION: Making Breakthroughs Daily

At the Virginia Institute of Marine Science, we provide the expertise and knowledge needed to address the problems affecting marine ecosystems, both in Chesapeake Bay and around the world.

Founded in 1940, VIMS is the nation's leading center for coastal and estuarine science, with a unique three-part mission of advisory service, research and education.

In our advisory role, we provide independent findings that inform policy solutions locally, nationally and internationally. Our research reveals the complex workings of aquatic ecosystems and offers practical solutions for managing fisheries, improving water quality and restoring marine habitats. Our education programs engage the public and produce tomorrow's marine science leaders.

Thanks to both public and private support, we will continue our stewardship of the Bay and other marine resources for the benefit of all.

> **Dr. John Wells** VIMS Dean and Director







Scientific & Environmental IMPACT | World-class research for a healthier tomorrow

BAY MANAGEMENT: Preserving a Vital Habitat

The research we undertake here at the Virginia Institute of Marine Science (VIMS) helps guide the wise management of Chesapeake Bay resources for today and tomorrow.

Ensuring that seagrasses thrive

Seagrasses provide refuge and food for marine organisms but are under threat from cloudy waters and rising temperatures. Our unique seagrass program monitors the changing coverage of underwater grasses in Chesapeake Bay and restores them to healthy areas. It is the largest and most successful seagrass restoration project in the world.

Helping blue crabs rebound

Blue crabs have played a central role in Chesapeake Bay since colonial times, but the Bay's blue crab population began a marked decline in the 1990s. At VIMS, we helped to identify this decline and are guiding the crabs' recovery. Today, the Bay's blue crab population is rebounding toward a sustainable level.

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Advancing oyster aquaculture

VIMS has played a critical role for more than 50 years in understanding the diseases and stresses that have decimated the Bay's oyster populations.

We have refined restoration strategies, and developed and distributed disease-resistant oyster strains. The oyster aquaculture industry around Chesapeake Bay is now growing rapidly as the result of our research.

"Healthy seagrass beds offer critical habitat for aquatic life and also help clear the water."

- Dr. Robert "11" Orth Professor of Marine Science



GLOBAL IMPACT: Clearing Out Dead Zones

VIMS Professor Robert Diaz is the world's leading expert on marine "dead zones"— waters with too little oxygen to support ocean life.

Assessing effects on coastal areas

Research by Diaz reveals that the number of dead zones worldwide has doubled each decade since the I960s. He has helped scientists and resource managers both at home and abroad to understand the scope of the problem, which costs millions for fisheries, impoverishes coastal ecosystems, and restricts choice and availability for seafood consumers.

Future benefits

Effective management to reduce the size and duration of dead zones will lead to significant improvements in the productivity and profitability of coastal fisheries and tourism.





VIMS faculty are ambassadors of knowledge for advisory bodies worldwide. Dr. John Graves chairs the U.S. delegation to the International Commission for the Conservation of Atlantic Tunas (ICCAT), the organization responsible for the management of tunas, marlin and other species in the Atlantic Ocean.





"VIMS has worked for decades with citizens, policymakers and industry leaders to improve the health of our waters for fishing, wildlife and recreation."

- Dr. Carl Hershner Professor of Marine Science

MARINE ECOSYSTEMS: Understanding Their Complexity

Addressing the problems that face the coastal ocean requires a fundamental understanding of how marine and terrestrial ecosystems work. The world-renowned experts at VIMS explore the many factors that govern the dynamics of ocean life. Our studies range from watersheds to the open ocean, with special emphasis on coastal systems.

Working to track pollutants

VIMS chemists and geologists explore the complex processes by which pollutants enter and cycle through Chesapeake Bay and the coastal ocean. And our professors have collaborated with industry to develop antibodybased biosensors for rapid detection of waterborne contaminants.

Aiding fisheries and more

Our long-term surveys of fish, shellfish and shark populations help in the management of both recreational and commercial fisheries. We also work to guide the sustainable management of billfish species for continued economic benefit. And our focus on quantifying the flow of carbon and nitrogen through ocean food webs has implications for both global fisheries and climate-change predictions.





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Economic IMPACT



SUCCESSFUL PARTNERSHIPS: Focusing on Ocean R&D

Scientists at VIMS have formed fruitful relationships in academia, government and industry focused on projects affecting Chesapeake Bay and the world's oceans.

Helping scallops flourish

Sea scallops are Virginia's most profitable fishery, with \$400 million in landings per year. Much of this success is due to a long-term collaboration between scallop fishermen, fishery managers and scientists at VIMS. Our effort to help maximize sustainable scallop harvests includes development of a system of rotating closed areas that allow scallop populations to rebound for up to five years following harvest.

Improving computer forecasting

Hampton Roads is an international hub for computer modeling and prediction. VIMS has played a key role, developing 3-D models to predict storm-surge flooding and sea level rise, forecast the path of oil spills and guide expansion of Virginia's growing ports.

Developing robotic submarines

VIMS Professor Mark Patterson patented one of the first autonomous underwater vehicles and has explored its use in both marine biology and homeland security. Our underwater robots have served on research missions in Chesapeake Bay, the Caribbean, Iceland, the Gulf of Mexico and Antarctica. "We're studying the harvest of wild algae for use as a biofuel. This has the added benefit of removing excess nutrients from coastal waters."

- Dr. Emmett Duffy Professor of Marine Science

VIMS professors Elizabeth Canuel and Emmett Duffy monitor their algal flow-way.

Educational IMPACT | Educating tomorrow's leaders today



SCIENCE AT WORK: Sharing the Knowledge

As one of the largest marine research and education centers in the country, the Virginia Institute of Marine Science offers learning opportunities to a broad range of audiences. From our graduate studies and coastal training programs to a wide selection of public programs and hands-on activities, VIMS makes the fascinating world of marine science accessible to adults and children of all ages.

Preparing future leaders in the School of Marine Science

Our graduate program is delivered through the College of William & Mary's School of Marine Science at VIMS. The School offers Master's and Ph.D. degrees in Marine Science and provides opportunities for applied work related to VIMS' advisory service role in the public and private spheres.

Public outreach to engage and inform

VIMS and its federal partners serve the citizens of Virginia and the mid-Atlantic region by offering a wide variety of free public programs, both on our main campus in Gloucester Point and at venues throughout Hampton Roads and the lower Chesapeake Bay region.

Training for Bay and ocean management

Virginia's coastal decision-makers rely on VIMS for the expertise and knowledge needed to manage Bay and ocean resources. Our Center for Coastal Resources Management offers Tidal Wetlands workshops for members of wetlands boards. The Chesapeake Bay National Estuarine Research Reserve at VIMS offers a coastal training program. And our Marine Advisory Services program works closely with schools, businesses, government agencies and individuals on a wide range of marine-related programs and activities.

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SCIENCE - IN - ACTION

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1. A young summer camper is excited to hold a square-backed marsh crab.

2. Professor Mark Patterson brings underwater technology to VIMS graduate students through an ocean observing course, one of only a handful taught in the nation.

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3. Associate Professor John Brubaker (back to camera) describes field equipment to members of the Association of State Flood Plain Managers onboard the research vessel Pelican.

4. VIMS graduate student Rob Condon samples jellyfish from the York River using a plankton net.

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SUPPORT FOR VIMS: Sustaining Our Mission

VIMS has the experienced personnel and hightech equipment to perform critical studies, apply breakthrough technology and provide the strategies needed to restore and sustain vital marine ecosystems. Yet less than half the VIMS budget is supported by the Commonwealth of Virginia. Private support is therefore essential to fulfilling our mission.

The VIMS Foundation, a 501(c)(3) nonprofit organization, was created in December 2000 as a resource to support VIMS faculty, students and research programs. It is governed by an independent Board of Directors.

Putting endowments to work

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Private gifts from individuals, foundations and corporations help endow student fellowships and professorships as well as other programs and projects.

The Foundation is also building a permanent unrestricted endowment to address future needs and launch new initiatives.

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The VIMS mission of advisory service, research and education is forever linked to our ongoing study and stewardship of Chesapeake Bay and its related resources. We are deeply indebted to the donors who already support our work, and we look forward to welcoming new friends to VIMS.

Making your impact

To learn more about how you can help VIMS and the VIMS Foundation, please contact the VIMS Development Office at 804.684.7099. More than half the world's population lives in coastal zones and 90% of the world's fish catch comes from coastal and estuarine systems. These simple facts are both eye-opening and problematic.

VIMS casts a wide net in its three-part mission of advisory service, research and education. More than 70 years of hands-on expertise in coastal and estuarine science, combined with the latest technology, enable us to address critical issues that affect us all.

We work on three campuses - the main one at Gloucester Point, Virginia, a field lab in Wachapreague on Virginia's Eastern Shore, and the Kauffman Aquaculture Center in Topping, Virginia, near the Rappahannock River.

Our mission is driven by societal needs, and we remain committed to the highest standards of objective science and to sharing our knowledge and discoveries to meet current and future challenges to our marine resources.





Learn more about VIMS and our studies of coastal and estuarine systems – vims.edu | 804.684.7000 | Rt. 1208 Greate Rd., Gloucester Pt., VA 23062