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2010 Annual Report The Virginia Institute of Marine Science July 1, 2009 through June 30, 2010

Virginia Institute of Marine Science

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2010 Annual Report

The Virginia Institute of Marine Science
July 1, 2009 through June 30, 2010



Letter from the Dean & Director

Dear Friends of VIMS:

The 2010 fiscal year was one of major accomplishments and recognition for VIMS and its faculty, staff, and students. At the same time it was a year of retrenchment, budget cuts, and great challenges, as it was for all state institutions of higher education in the Commonwealth. Yet thanks to our generous donors, we were able to support more students than ever through private giving and to acquire important new research instrumentation.

On the retrenchment side of the equation, we suffered the elimination of a number of staff positions, and have also now lost several faculty positions through retirements that we will be unable to fill until the economy and state revenues improve. I am pleased to note that VIMS has received substantial federal stimulus

funds that will help take us through the next fiscal year, but we recognize that these funds represent a one-time infusion. Despite the budgetary challenges, we are committed to balancing our three-part mission of research, education, and advisory service while conducting science at the highest level to benefit the Commonwealth and to contribute to the field of marine science nationally and internationally.

In our School of Marine Science, 10 students received their Master's degrees and 13 received the Ph.D. This past spring we accepted one of the best incoming classes ever.

VIMS ranked in the top 1% worldwide in terms of citations in the scientific literature in the fields of Environment & Ecology and Animal Science. Another

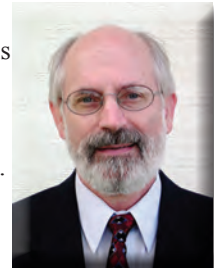
highlight was establishment of a five-year partnership with middle- and high-school teachers to enhance science instruction at four local schools. VIMS was one of only a few universities nationally to receive this major award from the National Science Foundation. The effort is called the PERFECT program—for Partnership between Educators and Researchers for Enhancing Classroom Teaching—and brings graduate students in VIMS' School of Marine Science into classrooms in order to improve the K-12 curriculum and stimulate interest in science. It also benefits the graduate students by providing experience in how to share science with students and the public most effectively.

If anyone ever wondered why marine science is so important to us all, this year's massive oil spill in the Gulf of Mexico provided a clear example. The Deepwater Horizon spill drove home the need to protect our natural resources even as we produce the energy our nation needs. Graduates of William and Mary's School of Marine Science at VIMS—including Don Boesch (Ph.D. '71), Irving Mendelsohn (M.A. '73), and Michael Carron (M.A. '76, Ph.D. '79)—are playing lead roles in the scientific response to the spill, as highlighted in this report and on our website. We are proud

that our alumni have been leaders during this crisis.

Our faculty were honored in many ways. Professor Deborah Bronk was elected President of the American Society of Limnology and Oceanography, the leading organization for these fields. The Governor of the Commonwealth along with the Science Museum of Virginia recognized Professor Eugene M. Bureson, Chancellor Professor of Marine Science Emeritus, as one of Virginia's outstanding scientists. Dr. Mark Patterson received an Outstanding Faculty Award from the State Council of Higher Education for Virginia, the state's highest honor for professors. He was the sole recipient in the "Teaching with Technology" category. Professor Romuald Lipcius was selected to participate in the Kavli Fellows program of the U. S. National Academy of Sciences, a highly coveted honor.

In the 2009-2010 academic year, the VIMS Foundation was able to support 14 students from 10 endowment funds established in the last few years by our donors. This support is ever more critical as stipends for VIMS graduate



John T. Wells



Newly installed breakwaters protect the VIMS shoreline

students lag behind those at our chief educational competitors. Our students continued to excel in research and scholarship, with several earning “Best Presentation” awards at national meetings and fellowships from the National Science Foundation. Doctoral candidates Heidi Geisz and Anna Huntley received prestigious Knauss Fellowships from NOAA.

Summer 2010 saw the second year of a series of five weeklong summer camps made possible by an anonymous gift to the VIMS Foundation. Camps were offered to students from first through eighth grade. Their activities are pictured inside this report. Who knows? Participation in a VIMS camp may inspire one of these children into a future career as a leading marine scientist.

Most importantly I want to thank the volunteer members of the VIMS Council and the VIMS Foundation. The year saw a transition in leadership of the VIMS Council with Robert Roper remaining on the board but rotating out as Chair. Bob contributed in many ways to VIMS as a donor and Council leader, aligning Council activities with the VIMS strategic plan. L. D. (Rick) Amory, III was elected the new Chair of the Council and brings a wealth of knowledge about the Port of Hampton Roads and the seafood industry.

The VIMS Council is a group of some of the Commonwealth’s most distinguished citizens who advise VIMS on a myriad of activities. We are deeply grateful to all of them.

Carroll W. Owens, Jr., President of the VIMS Foundation, ably led a dedicated board overseeing the Foundation. The VIMS Foundation uses the William and Mary Investment Trust (WAMIT) for its investable funds, and I am pleased to say that WAMIT weathered the economic downturn relatively well as outlined inside this report. We appreciate the work of all members of the VIMS Foundation Board in their stewardship of our endowed funds.

On the alumni front, Maurice “Mo” Lynch continued to take a lead in expanding outreach to our more than 700 alumni, and I am pleased to report that alumni support of VIMS has increased significantly in

the last few years, an important vote of confidence for our future.

In 2011 we will celebrate the 10th Anniversary of the VIMS Foundation and hope to reach \$10,000,000 in assets in private support of VIMS. Thanks to a generous \$500,000 pledge by former President of the VIMS Foundation E.Morgan Massey, we are on our way towards this goal and are working to raise the remainder. We hope that some of our loyal friends will participate in the coming year to help us build current endowments and create new ones to secure the future of VIMS’ education and research programs. Thank you to all our donors and friends of VIMS!

John S. Wilkes
 Dean and Director



*VIMS Foundation Board
 President Carroll Owens*



*VIMS Immediate past-
 Council Chair Robert P.
 Roper, Jr. and Mrs. Roper*



*From L: Council Chair Rick Amory
 with ESL Director Mark Luckenbach
 and Council members Tom Young
 and Stephen Johnsen*



*E. Morgan Massey, Former
 Foundation President and
 current Board member*

Science for Society

These selected news stories highlight the many ways in which VIMS researchers use financial support from state, federal, and private sources to provide knowledge and solutions to the challenges facing our marine resources.

VIMS helps bring science to Gulf spill

VIMS researchers and alumni are helping to craft the nation's scientific responses to the Deepwater Horizon oil spill in the Gulf of Mexico.

Dean and Director John Wells and professor Carl Hobbs represented VIMS in the immediate scientific response to the spill and in efforts to place it within the broader goal of restoring the area's coastal wetlands. Wells has served on the Louisiana Coastal Area Science Board since 2006.

Graduates of the School of Marine Science at VIMS are also playing a lead role in the scientific response to the spill. Don Boesch (Ph.D. '71), president of the University of Maryland Center for Environmental Science, is serving on the President's national oil spill commission. Michael Carron (M.A. '76, Ph.D. '79), Director of Mississippi State University's Northern Gulf Institute, is leading a massive effort to understand the spill's ecological impact. Irving Mendelssohn (M.A. '73), a professor at Louisiana State University, has been a lead scientific voice concerning the spill's impact on salt marshes.

More recent alumni, including Rob Condon (Ph.D. '08) and Leigh McCallister (Ph.D. '02), are also contributing. Condon, a researcher at Alabama's Dauphin Island Sea Lab, is examining the spill's impact on the Gulf food web. McCallister, a professor at Virginia Commonwealth University, is studying the consumption of oil by marine bacteria.

Wells notes that VIMS' primary role in regards to oil spills is to track, model, and assess the ecological impacts. "Even though this spill wasn't in our



VIMS alumnus Don Boesch, a member of the President's Oil Spill Commission, talked about his work on the spill during a public lecture at VIMS.



Professors Elizabeth Canuel and Emmett Duffy lead the VIMS effort to turn nutrient pollution into fuel.

backyard," says Wells, "we should and do care about using marine science to help the region respond and recover."

Algae initiative aims to produce fuel while helping the environment

VIMS and the College of William and Mary have formed a collaborative research initiative to explore biofuel production using algae growing naturally in Chesapeake Bay.

The enterprise, called ChAP—the Chesapeake Algae Project—is an integrated research approach to algae-based energy production and environmental remediation. It includes a number of corporate partners, notably StatoilHydro, a Norwegian energy company that has seeded the enterprise with an initial \$3 million investment.

Other key partners are the Williamsburg-based Blackrock Energy, the University of Maryland, the Smithsonian Institution, the University of Arkansas, Western Michigan University, and HydroMentia, a Florida company that works with water-treatment technologies.

"This is the kind of collaboration at which William & Mary excels," William & Mary President Taylor Reveley said.

The ChAP group is investigating a process that is not only environmentally sustainable, but could help to reverse environmental problems such as excess nutrient enrichment that produce "dead zones" in Chesapeake Bay and other waters.

Lead researchers at VIMS are J. Emmett Duffy, the Loretta and Lewis Glucksman Professor of Marine Science, and Professor of Marine Science Elizabeth Canuel—*story by Joe McClain.*

Long-term study shows oysters developing disease resistance

VIMS' 50-year monitoring program shows that Chesapeake Bay oysters are developing resistance to the pair of diseases—MSX and Dermo—that have contributed to their decline.

This is despite the increasing prevalence in the Bay of the parasites that are responsible for the two diseases.

Researchers in VIMS' Shellfish Pathology Laboratory began gathering the data in 1960. Each May, the researchers collect about 700 oysters from a disease-free area in the Bay, then transport them to the saltier waters of the York River near VIMS, where they are placed in cages and monitored each month through October for signs of disease.



VIMS researchers sample oysters.

Ryan Carnegie, an Associate Research Scientist in Shellfish Pathology Lab, says "These oysters have undergone no selection for resistance to disease. The prevalence of parasites in their tissues at the end of the summer thus tells us how much MSX and Dermo is really out there in the Bay."

Results of the program show an upward trend in the prevalence of both diseases among the transplanted oysters.

The good news comes from the lab's two other studies of wild oysters in the James River. Despite the increasing abundance of disease-causing parasites among the spring imports, data from these studies show a decrease or leveling off in MSX and Dermo among resident oyster populations in the lower James.

Carnegie says "decreased disease in the wild despite favorable conditions for the parasites is a clear sign of increasing resistance among our native oysters due to long-term exposure."

Understanding the genetic basis of resistance could help efforts to restore oysters to the Bay and to enhance oyster aquaculture.

W&M offers new minor in marine science

VIMS is partnering with William & Mary to offer a new undergraduate minor in marine science. The minor, designed to meet a strong and growing interest in marine

science among W&M undergrads, features courses taught by faculty at VIMS and in natural-science departments at the College's Williamsburg campus. Faculty in the School of Marine Science at VIMS have previously offered courses primarily to graduate students. VIMS has awarded more than 800 Master's and Ph.D. degrees in marine science since 1943.

The new undergraduate minor will initially be offered as a 3-year pilot program for 20 students per year. The minor's field-studies course will take place at VIMS' Eastern Shore Laboratory, where students will receive hands-on instruction in and around Virginia's barrier-island ecosystem.

VIMS Professor Elizabeth Canuel, a leader in establishing the new minor, says the program meets a clear need. "Over the past decade," says Canuel,



Professor Deborah Steinberg teaches first-year graduate students as W&M undergraduates follow along via video.

"we've seen a growing number of W&M undergrads interested in pursuing research projects with our faculty, and enrolling in our undergraduate- and graduate-level courses."

VIMS Dean and Director John Wells says the minor represents "an exciting new chapter in VIMS' long history of providing an exemplary education in marine science." VIMS Graduate Dean Iris Anderson notes that the minor will also provide teaching experience for graduate students at VIMS through the provision of two teaching assistantships.

The new minor has received strong endorsements from W&M President Taylor Reveley and Provost Michael R. Halleran. "This is a great example of the benefits that come with expanded collaboration between our schools and their talented faculty," says Halleran.

Blue crab population booms

VIMS' winter dredge survey shows a 60% increase in Chesapeake Bay's blue crabs since last year, reaching the highest level measured since 1997.

Virginia Governor Bob McDonnell and Maryland Governor Martin O'Malley agree that the population has surged for the second year in a row because of a landmark stock-rebuilding program.

Rom Lipcius, who directs the Virginia component of the dredge survey for VIMS, said, "The substantial rise in abundance of mature crabs and juveniles was clearly a response of the crab population to unprecedented management actions, such as the closure of the winter dredge fishery, by the Virginia Marine Resources Commission and partner agencies. The increase was neither a random event nor a reflection of improved environmental conditions. From here on, we have to maintain the population at these levels to ensure the long-term sustainability and resilience of the Chesapeake Bay stock."



Chesapeake Bay blue crab (Callinectes sapidus)



Virginia Senator Mark Warner visited VIMS to discuss oyster restoration strategies in Chesapeake Bay. From L: Research Assistant Professor Ryan Carnegie, Director of Research and Advisory Service Roger Mann, VIMS Dean and Director John Wells, Senator Warner, ABC Director Stan Allen, Breeding Research Manager Anu Frank-Lawale, Professor Woody Hobbs, and Chief Administrative Officer Jennifer Latour.

VIMS begins long-term partnership with local schools

VIMS has begun a five-year partnership to enhance science instruction at four local schools.

The PERFECT program—for Partnership between Educators and Researchers for Enhancing Classroom Teaching—connects graduate students in

VIMS' School of Marine Science with teachers and pupils at Booker T. Washington Middle School in Newport News, Chesapeake Bay Governor's School in Rappahannock, Page Middle School in Gloucester, and York High School in Yorktown.

The program, funded by the National Science Foundation, is the brainchild of VIMS professor Kam Tang, Graduate Dean Iris Anderson, and Virginia Sea Grant educator Vicki Clark.

Tang says the goal of the program is "to bring real-life scientists into classrooms in order to improve the K-12 curriculum and stimulate interest in science." He notes that PERFECT is the only scientist-teacher partnership in the Chesapeake Bay region to focus on marine science. "It provides invaluable teaching and learning experiences that go beyond conventional graduate training," says Tang.

Patti Griffin, Principal of the Chesapeake Bay Governor's School, says the program is "absolutely wonderful—it provides tremendous opportunities for our students to learn from role models and explore career options. It's a real win-win."

VIMS faculty chose nine graduate student fellows for the program's first year. Selections were based on academic achievement, enthusiasm, and the match between student and teacher interests.



VIMS GK-12 fellow Lila Rose talks science with her 7th-grade class.

Service to Virginia and the Nation

VIMS faculty and staff provide advisory service to policymakers and resource managers at local, state, national, and international levels. Their science-based expertise contributes to sustainable use of marine resources worldwide. Below is a sampling of the many forms of advisory service at VIMS.

Donna Bilkovic serves an at-large appointment to the Chesapeake Bay Program's Scientific and Technical Advisory Committee and its Habitat Goal Implementation Team.

Deborah Bronk is President of the American Society of Limnology and Oceanography, and a member of the Carbon Cycle Science Plan Working Group, the US National Committee for the Intergovernmental Oceanographic Commission, and the Nutrient Criteria Review Panel for the Environmental Protection Agency. She is an elected member-at-large of the Council of Scientific Society Presidents, and co-chair of its Committee on Energy and the Environment.

Mark Brush is a member of the Chesapeake Bay Program's Tidal Monitoring and Assessment Workgroup and Monitoring Re-Alignment Action Team, and serves on the governing board of the Atlantic Estuarine Research Society.

Elizabeth Canuel serves on the Delta Independent Science Board for the Sacramento-San Joaquin River Delta in California.

Robert Diaz is a member of advisory panels within UNEP and UNESCO developing nutrient-reduction strategies to improve coastal environments.

Emmett Duffy is a member of the Biodiversity Working Group of the Federal Joint Subcommittee on Ocean Science and Technology—Ocean Partnerships.

Mary Fabrizio serves on the Board of Directors of the Hudson River Foundation.

Carl Friedrichs serves on the steering committees for the Chesapeake Bay Observing System and the Chesapeake Community Modeling Program, and is an at-large member of the Chesapeake Bay Program's Scientific and Technical Advisory Committee.

Marjorie Friedrichs provides guidance to the United Nations concerning the computer models that are used to project the magnitude and rate of climate change. She is also an at-large member of the Chesapeake Bay Program's Scientific and Technical Advisory Committee and on the Steering Committee for its Umbrella Criteria Workshop.

John Graves is Chair of the U.S. Advisory Committee to the International Commission for the Conservation of Atlantic Tunas, and a member of the National Marine Fisheries Service's Highly Migratory Species Advisory Panel. He is also a member of the International Union for the Conservation of Nature Tuna and Billfish Specialist Group.

Kirk Havens serves as one of two Governor's appointees to the Chesapeake Bay Program's Scientific and Technical Advisory Committee. He also serves on the Scientific and Technical Advisory Committee for the Albemarle-Pamlico National Estuary Program in North Carolina.

Eric Hilton serves as the Virginia representative to the Atlantic States Marine Fisheries Commission Shad and River Herring Technical Committee and is a member of the Board of Governors of the American Society of Ichthyologists and Herpetologists.

John Hoenig was appointed to the Science and Statistics committees of the New England and South Atlantic fishery management councils. He serves on the Tautog Technical Committee, the Striped Bass Tagging Subcommittee, and the Interstate Tagging Committee of the Atlantic States Marine Fisheries Commission. He also serves on the Chesapeake Bay Stock Assessment Committee for the National Marine Fisheries Service's Chesapeake Bay Office.

Rob Latour is Chair of the Menhaden Technical Committee of the Atlantic States Marine Fisheries Commission, and a member of the Scientific and Statistical Committee for the Mid-Atlantic Fishery Management Council.

Mark Luckenbach is a member of the Chesapeake Bay Program's Scientific and Technical Advisory Committee, the

Maryland Coastal Bays' Scientific and Technical Advisory Committee, and the Maryland Oyster Commission. He also serves on the TMDL Implementation Committee for Virginia's Department of Environmental Quality and Department of Conservation and Recreation.

Mark Patterson is Technical Chair of 2011 Association of Unmanned Vehicle Systems International Annual Meeting. He serves on the Steering Committee for the Port and Harbor Security Cluster with Innovate!Hampton Roads, a program of the Hampton Roads Partnership.

Jeff Shields is the US delegate to the ICES' Work Group on the biology and life history of crabs (ICES = International Council for the Exploration of the Seas).

Walker Smith is a member of the Scientific Steering Committee for the National Science Foundation's Ocean Carbon and Biogeochemistry Initiative.

Deborah Steinberg is a member of the International Council of Scientific Unions, Scientific Committee on Ocean Research.

Kam Tang is a member of the American Society of Limnology and Oceanography's Diversity Committee.

Mike Unger is on the Board of Directors for the Elizabeth River Project.

John Wells serves on the Science Board for the Louisiana Coastal Area Ecosystem Restoration and Protection Program.

Awards and Recognition

Faculty

VIMS professor named Outstanding Scientist

Eugene Burreson received one of three Outstanding Scientist awards for Virginia for 2010. The award is bestowed annually by the Governor's Office and the Science Museum of Virginia to honor those who have excelled in research and commitment to science, and whose contributions to scientific research have extended the boundaries of their own and other fields.

Burreson, who retired as Chancellor Professor of Marine Science in January 2010, spent 34 years at VIMS. An internationally recognized shellfish pathologist, Burreson was a pioneer in the study of MSX and Dermo—diseases that have helped push Chesapeake Bay's oyster population to one percent of historical levels.

Outstanding Faculty Award

Mark Patterson received the state's highest honor for professors from the State Council of Higher Education for Virginia (SCHEV). The award recognizes the finest among Virginia's college faculty for their demonstrated excellence in teaching, research, and public service. Patterson received the

Chancellor professor Eugene Burreson (L) received his Outstanding Scientist award from Virginia Governor Bob McDonnell.



VA Secretary of Education Gerard Robinson; William C. Hall, Vice President of Dominion Resources and President of the Dominion Foundation; Mark Patterson; and Daniel J. LaVista, Past Executive Director of SCHEV.

VIMS professor Rom Lipcius (foreground) and his research crew prepare to stock native oysters on a reconstructed oyster reef in the Lynnhaven River.



Outstanding Faculty Award (OFA) in the "Teaching with Technology" category for his "record of superior accomplishment in the use of innovative educational/instructional technologies." An underwater explorer, inventor, and entrepreneur, Patterson has served VIMS and William & Mary for 16 years.

VIMS a partner in Coastal America Award

The Lynnhaven River Oyster Restoration Team—a partnership between VIMS, the Army Corps of Engineers, the City of Virginia Beach, the Virginia Marine Resources Commission, and Lynnhaven River NOW—received a 2009 Coastal America Partnership Award for innovative efforts to restore the river's native oyster population. Coastal America is a group of federal agencies, state and local governments, and private organizations established in 1992 to protect, preserve, and restore the nation's coastal resources. The VIMS contingent included **Rom Lipcius, Stan Allen, Ryan Carnegie, Mark Luckenbach, Danielle McCulloch, and Rochelle Seitz.**



(L to R) Rob Latour, Carl Friedrichs, and Steve Kuehl

received Plumeri Awards for Faculty Excellence from the College of William and Mary in recognition of their exemplary achievements in teaching, research, and service. The awards are named in recognition of Joseph J. Plumeri II '66, who in the spring of 2008 made a significant commitment to his alma mater to “honor and support” its faculty. The awards include a \$10,000 prize for each recipient. The funds are to be applied toward research, summer salaries, or other stipends associated with scholarly endeavor, with the ultimate intention of enhancing faculty interaction with students.

Kam Tang received an Alumni Fellowship award from the College of William and Mary for his contributions to teaching and scholarship. Established in 1965 and first presented in 1968, the awards are given annually to five younger faculty members who are particularly outstanding as teachers. Tang, an associate professor of

marine science at VIMS, works with graduate students and other colleagues to investigate plankton and other microscopic organisms that form the basis of the ocean’s food web. His research has brought him from China to Antarctica.

John Graves was named a Chancellor Professor of Marine Science by the College of William & Mary. The title reflects acclaim for past accomplishments and the promise of producing additional notable achievements in scholarship.

Rob Hale received an Excellence in Review Award for 2009 for his peer review of research articles in *Environmental Science & Technology*, a leading journal of the American Chemical Society.

Rom Lipcius was named a 2009 Kavli Fellow by the US National Academy of Sciences. The Kavli Fellowship program provides an opportunity for future science leaders to network with their colleagues in other disciplines.

Jeff Shields received a Certificate of Special Congressional Recognition from U.S. Senator Sheldon Whitehouse of Rhode Island in recognition of his contributions to studies of health issues in lobsters from Southern New England.

Kam Tang was named the Robert F. and Sara M. Boyd Term

Distinguished Associate Professor by the College of William and Mary. Term professorships recognize and reward excellence in research or creative activity and demonstrated commitment to teaching.

Staff

Facilities Management staff

received two prestigious awards in recognition of exemplary performance in managing wastewater on VIMS’ 40-acre shoreline campus in Gloucester Point. They received a Diamond Award from the Hampton Roads Sanitation District for 10 consecutive years of perfect compliance with HRSD’s wastewater permit. VIMS also received an Industrial Waste and Pretreatment Environmental Excellence award in the Platinum Category from the Virginia Water Environment Association.

Carol Hopper Brill received the 2010 President’s Choice Award from the Mid-Atlantic Marine Education Association for her dedication to improving marine education. Hopper Brill served as a state representative and most recently completed the three-year cycle as President.

Jon Lucy was honored by the Virginia Marine Resources Commission for his 16-year partnership with the Virginia Game Fish Tagging Program. The program uses recreational anglers to enhance

tagging and data-collection efforts for specific species of fish.

VIMS Service Awards

Freeman Volunteer of the Year
Maurice P. Lynch

Facilities/Safety/Trades
Kenneth Borkey

Research/Advisory Service
Jim Gartland

Technical Support
Grace Cartwright

Administrative Support
Ruth A. Hershner

Dean’s Prize for the Advancement of Women in Marine Science
Steven A. Kuehl

Outstanding Faculty Advisory Service Award
William D. DuPaul



Dr. DuPaul and students aboard a scallop vessel

School of Marine Science

Graduate students in the School of Marine Science at VIMS have an unparalleled opportunity to conduct research that matters, with many pursuing research and policy avenues that bring them in close contact with industry and management agencies at the state, regional, and international levels. Here are some highlights of student accomplishments in 2009-2010. A full list of theses and dissertations for 2009-2010 is available at www.vims.edu/library.

External Student Awards

Emily Brault received an Honorable Mention in the National Science Foundation's Graduate Fellowship program.

Kate Brodie received the Natural Hazards Focus Group Award for Outstanding Student Paper for her presentation "Measuring Bathymetry, Runup, and Beach Volume Change during Storms: New Methodology Quantifies Substantial Changes in Cross-

Shore Sediment Flux" at the American Geophysical Union Fall Meeting.

Andre Buchheister received a scholarship from the International Women's Fishing Association.

Russ Burke received the Benjamin Stoddert Ewell Award "For Outstanding Participation and Leadership in Campus and Community Activities and for Service and Contribution to the College."

Karen Capossela won the Best Student Presentation at the 2009 AFS Tidewater Chapter Meeting and an AFS Marine Fisheries Section Travel Award.

Heidi Geisz and **Anna Huntley** were selected to receive prestigious Knauss Fellowships from NOAA.

Mark Henderson was granted a Sea Grant Population Dynamics Fellowship for 2009-2010 from the National Marine Fisheries Service.

Emily Jayne was awarded a National Science Foundation Graduate Fellowship.

Laurie Sorenson won the Stoye Award for the Best Student Oral Presentation (Conservation) at the Annual Meeting of the American Society of Ichthyologists and Herpetologists.

Branson Williams was awarded an AFS Equal Opportunities Section Travel Award and a Hall-Bonner Fellowship.



L to R Knauss Fellows Anna Huntley and Heidi Geisz

VIMS Student Awards*

John E. Olney Sr. Ichthyology Award

Jennifer Martin

Craig L. Smith Memorial Scholarship

Wenda Ribeiro Quidort

Kelley Watson Fellowship

Jonathan Lefcheck

Zeigler Student Achievement Award

Da Chen

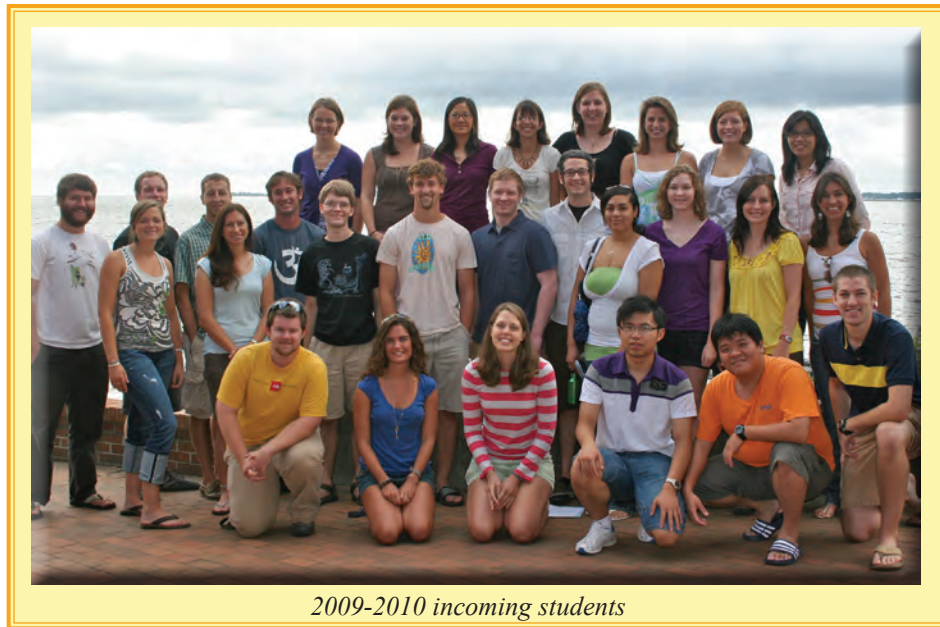
William J. Hargis Jr. Fellowship Award

Jaime Blackburn

Matthew Fontaine Maury Fellowship Award

Sarah Schillawski

** These awards are supported by endowments in the VIMS Foundation.*



2009-2010 incoming students

Best Student Papers

Master's

Patrick Lynch, Mark Brush, Elizabeth Condon, and Rob Latour 2010. Net removal of nitrogen through ingestion of phytoplankton by Atlantic menhaden *Brevoortia tyrannus* in Chesapeake Bay. *Marine Ecology Progress Series*.

Ph.D.

Jianmin (Jimmy) Ye, Erin Bromage and Steve Kaattari. 2010. The strength of B cell interaction determines the degree of IgM polymerization. *Journal of Immunology*.

Student Research Highlights

Study shows taller reefs in large sanctuaries are key to oyster restoration

A 5-year study of oyster-restoration techniques in Chesapeake Bay shows that taller reefs in an extensive network of large sanctuaries is critical for re-establishing self-sustaining populations of native oysters.

The study was conducted by VIMS graduate students David Schulte and Russ Burke, and professor Rom Lipcius. They compared oyster abundance and growth on reefs built to stand 10-18 inches above the seafloor with reefs that rise only 3-5 inches. The US Army Corps of

Engineers constructed the reefs in 2004 by placing old oyster shells in the Great Wicomico River, a small Chesapeake Bay tributary that lies between the Rappahannock and Potomac rivers. Harvesting of oysters on these sanctuary reefs is prohibited. Sampling by the VIMS team in 2007 showed that the taller Wicomico reefs had four times as many oysters as the shorter reefs, and that the oysters on the taller reefs were bigger and faster growing. All the oysters grew from larvae released by nearby wild oysters.

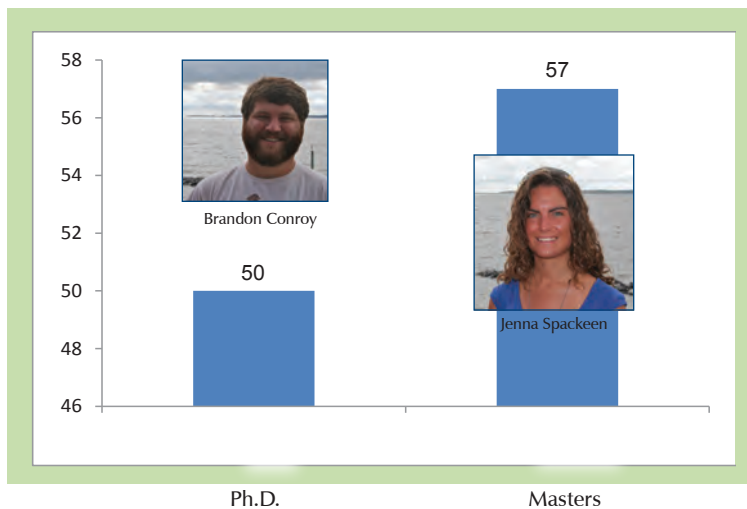
The researchers say the taller reefs are successful because they expose their oysters to stronger currents, which sweep away sediments and provide a steady stream of food, which promotes rapid growth and helps the

oysters better resist the diseases that purportedly kill most Bay oysters before they reach their second year (though evidence is mounting that oysters can develop disease resistance if provided with adequate reef structure). The higher quality reefs also attract higher numbers of young oysters, increasing the chances they will be self-sustaining over a long period of time.

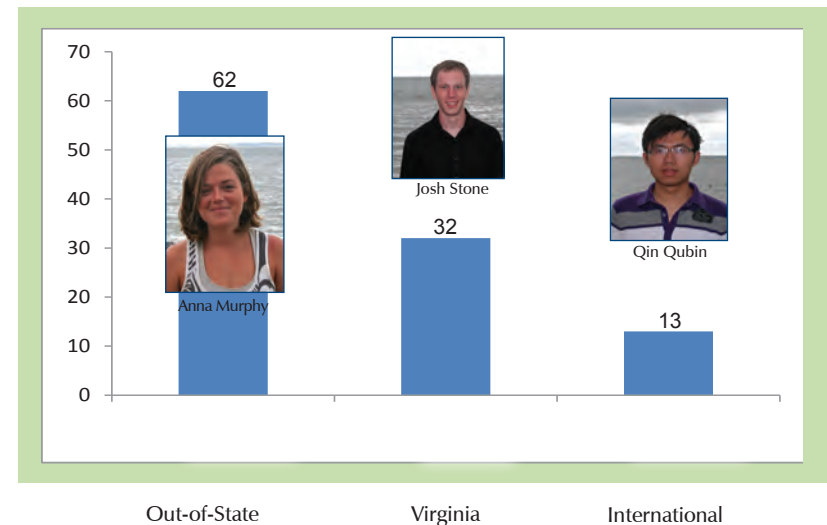
Menhaden appear to have little net impact on Bay water quality

A study led by VIMS graduate student Patrick Lynch suggests that filter feeding by Atlantic menhaden has little net effect on overall water quality in Chesapeake Bay.

The study is part of a larger effort, including work by VIMS professors



Graduate School Statistics 2009-2010



Rob Latour and Mark Brush, to understand the role of menhaden in the Bay ecosystem. Driving the effort are public concerns about the status of the Atlantic menhaden stock in light of a major commercial fishery and interest in the fish as a natural filterer for improving Bay water quality.

Lynch says “Menhaden play an ecological role as filter feeders that can potentially help clear nutrient-polluted waters. We wanted to quantify their influence on Chesapeake

Bay water quality by measuring their ability to eat phytoplankton and thus remove nutrients like nitrogen from the water column.”

The researchers did their study in the laboratory, measuring the amount of phytoplankton and nitrogen consumed and excreted by small groups of juvenile and adult menhaden in 90-gallon tanks filled with water from the York River. Extrapolating the results of these lab experiments to population-level estimates for

Chesapeake Bay suggests that the Bay’s menhaden probably play little role in removing nitrogen from Bay waters, and may actually provide additional nitrogen to Bay phytoplankton.

The researchers caution that their calculations of Baywide nitrogen removal rest on estimates of the Bay’s total menhaden population—a number that is difficult to gauge due to a lack of monitoring programs and the schooling nature of the fish. “A better

understanding of spatial variations in menhaden abundance within the Bay would give us a better idea of where menhaden may play a larger role,” says Brush. “While our calculations show little impact at the Baywide scale, menhaden may still be locally important if large numbers overlap with large phytoplankton blooms.”

The study was funded by the Chesapeake Bay Program and the Keith Campbell Foundation for the Environment.

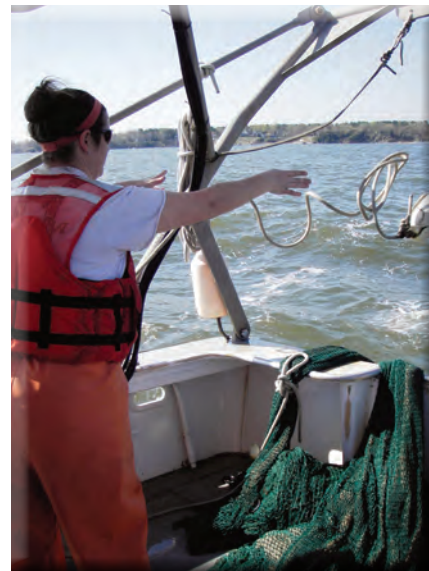


A student studies how sea-level rise might affect seagrass

Testing for Perkinsus



Ichthyology Lab dye experiments



Tossing tag line to capture fish



Students conducting lab experiments

Outreach



Marine Science Day

Marine Science Day 2010 brought another record crowd of more than 2,300 visitors to the VIMS campus for hands-on exhibits showcasing research in Chesapeake Bay and around the world. The Children's Pavilion, York River seining, laboratory tours, and the Parade of Marine Life engaged participants young and old.

After Hours Lectures

Sand Management 101: Beach Nourishment in Virginia

(June 24, 2010) Scott Hardaway, head of VIMS' Shoreline Studies program, described Virginia's sand resources and the history of beach-nourishment efforts in Virginia including Virginia Beach and Factory Point.

State of the Bay 2010

(April 29, 2010) Professor Carl Hershner compared and contrasted the Chesapeake Bay "report cards" issued by various organizations each year concerning Bay health.

Birds of Prey in the Bay

(March 25, 2010) Raptor expert Bryan Watts of the Center for Conservation Biology at W&M explored the natural history of ospreys, bald eagles, and other birds of prey and their role in the Bay ecosystem.



Werowocomoco

(February 25, 2010) W&M anthropologist Martin Gallivan described what archeological evidence from Werowocomoco tells us about Native American culture, resource use, and interactions with early European colonists.

Rising ocean acidity: the other CO₂ problem

(January 28, 2010) Professor Deborah Bronk explored the troublesome impacts of excess carbon dioxide on ocean acidity. Bronk described the science behind ocean acidification and its possible effects on marine organisms and ecosystems.

Is there oil on our horizon?

(October 22, 2009) Professor Woody Hobbs described the geologic likelihood of petroleum discovery on Virginia's continental shelf and potential environmental issues related to oil extraction and refining.

Is our energy future blowing in the wind?

(September 24, 2009) VIMS alumnus Charles Natale explored the environmental opportunities and regulatory challenges associated with development of offshore renewable wind energy projects along the US East Coast and in Virginia. Natale is President and CEO of ESS Group, Inc., one of the Northeast's largest environmental consulting and engineering companies.

A Tale of Two Coasts: The Mississippi Delta and Chesapeake Bay

(August 27, 2009) Dean and Director John Wells, a member of the Louisiana Coastal Protection and Restoration Science Board, described efforts to restore and manage the Mississippi Delta, and how the lessons learned there apply to Chesapeake Bay.



Oil-spill drills ensure that VIMS personnel remain familiar with emergency procedures and that emergency equipment is in tip-top shape.

Winter in July: VIMS Research in Antarctica

(July 30, 2009) Professor Deborah Steinberg described VIMS' diverse research efforts in the waters around Antarctica. Teams of VIMS scientists are frequent visitors to the coastline of the southern continent, and play a key role in the quest to understand Antarctic marine ecosystems and their response to climate change.

Guided Tours

Guided tours gave nearly 500 adults and older children a behind-the-scenes look at VIMS. Tours typically include a visit to the Visitor's Center and Aquarium, a research laboratory, and the Teaching Marsh.

Speaker's Bureau

VIMS faculty and staff presented 22 invited talks to more than 400 citizens and students at community organizations, schools, clubs, businesses, and other venues throughout Hampton Roads and the Northern Neck.

Fairs and Festivals

Staff, students, and faculty interacted with more than 600 people from a VIMS-sponsored booth during 6 public festivals or fairs, including the Urbanna Oyster Festival, the Watermen's Heritage Festival, and the Gloucester Daffodil Festival.



Chesapeake Bay National Estuarine Research Reserve Discovery Labs

A Waterman's Life (June 15, 2010) Waterman Voight Hogge described how Chesapeake Bay watermen make a living.

Babies in the Bay (April 20, 2010) VIMS Ph.D. student Todd Clardy talked about larval fish in the Bay and described the Bay's importance to the young of many species.

Shipwrecks (March 16, 2010) Shannon Ricles and Lauren Heesemann of the Monitor National Marine Sanctuary discussed the wreck of the USS *Monitor* and other shipwrecks in the area and their ecological value.

Insects (February 16, 2010) Noted entomologist Dr. Art Evans explored the world of insects in the Chesapeake Bay watershed.

Marine Mammals (January 19, 2010) Mark Swingle of the Virginia Aquarium explored the natural history of marine mammals in Chesapeake Bay and Virginia's coastal waters.

Lurking in the Shadows (October 22, 2009) The 3rd annual Mad Lab provided an opportunity to learn about the animals that lurk in the shadows of Chesapeake Bay.

GPS, Buoys, Robots and More (September 15, 2009) SeaGrant educator Chris Petrone explored the technologies used to study Chesapeake Bay.

Sponge Bob: Meet the Crew (August 17, 2009) VIMS technician Joe Cope showed how characters from the popular TV show fit within the Bay ecosystem.

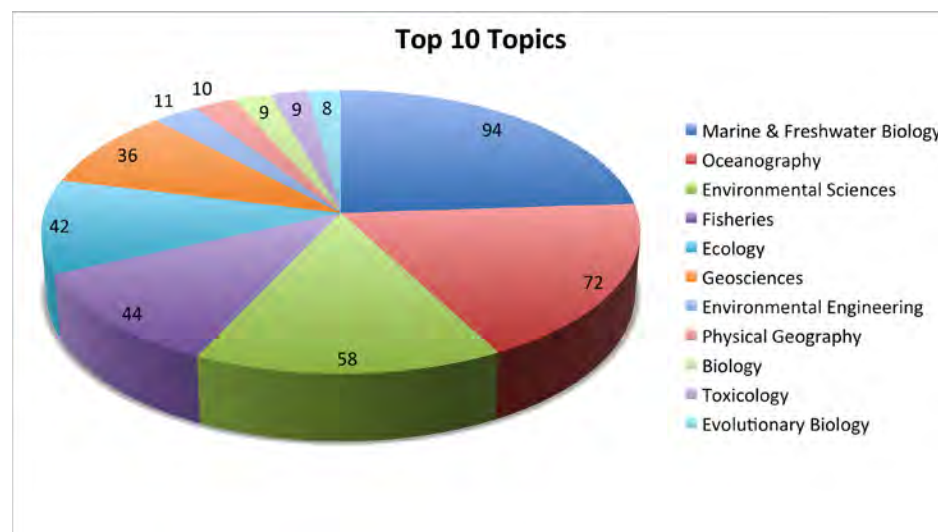
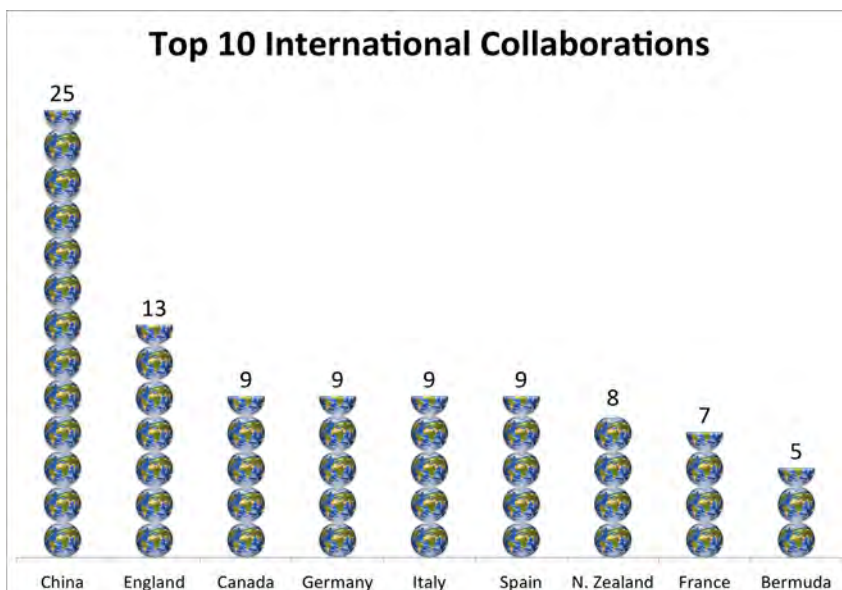
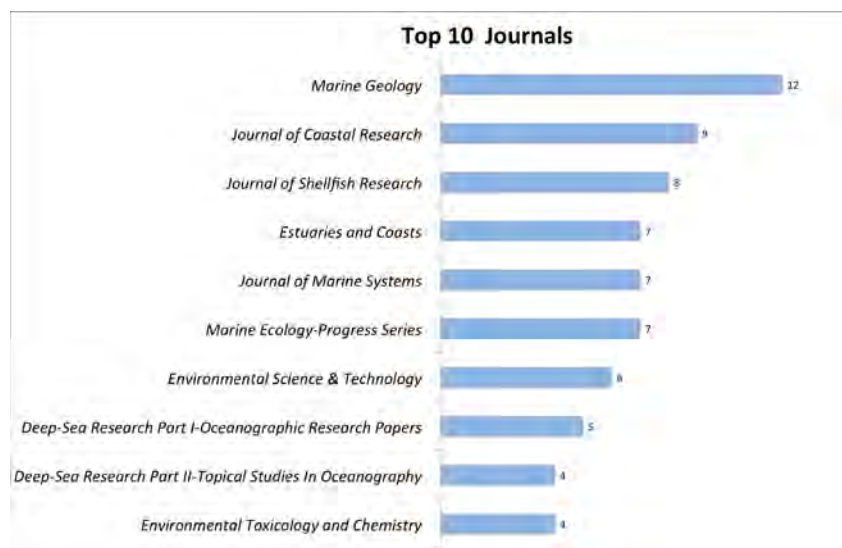
Chesapeake Bay Revealed (July 20, 2009) Glen Markwith gave an in-depth look at how Chesapeake Bay was formed, its importance in history and today, and the diversity of life that calls it home.

The monthly Discovery Lab series drew scores of adults and children to the VIMS campus in Gloucester Point.



Publications

VIMS researchers publish hundreds of journal articles, technical reports, and other scientific communications each year. Here's a statistical snapshot of the journal articles published by VIMS faculty, staff, and students between January 2009 and September 2010. A full list of VIMS-authored journal articles is available at vims.edu/library.



Citation analysis shows VIMS in top 1 percent worldwide

VIMS ranks in the top one percent of institutions worldwide in two fields based on a standard measure of scientific accomplishment—the number of times that colleagues cite an earlier journal article within their own research papers.

The citation ranking, by Thomson Reuters Essential Science IndicatorsSM, shows that VIMS entered the top 1% among institutions in the field of Environment & Ecology in September 2009, and it did so with the highest cite count among new entrants in this discipline. The analysis shows that VIMS was

already in the top 1% in the field of Plant & Animal Science.

VIMS Dean and Director John Wells says the ranking “adds quantitative support to the excellent reputation that our researchers have earned among peers for their contributions to the scientific literature.”

Essential Science IndicatorsSM tracks the citation records for research articles published in 22 fields.

During the 10-year period examined, VIMS faculty, staff, and students had authored or co-authored 137 papers cited 1,807 times in the field of Environment & Ecology, and 315 papers cited 2,936 times in the field of Plant & Animal Science.

Alumni Receptions

VIMS has begun holding alumni receptions in conjunction with national meetings of marine-science societies such as the Coastal and Estuarine Research Federation (CERF), the American Society of Limnology and Oceanography (ASLO), and the American Fisheries Society (AFS). The receptions provide an opportunity for renewing professional and personal ties, and give current students a chance to talk with distinguished alumni from around the world.



The most recent alumni reception, at the annual CERF meeting in Portland, Oregon, drew an enthusiastic crowd of current and former scientists and students.

Giving Highlights

Private giving and the VIMS Foundation advance education and research

With the 10th Anniversary of the VIMS Foundation in 2011, we have set a goal to bring Foundation assets to \$10,000,000 by the end of next year, up from \$7,000,000. Thanks to a generous \$500,000 pledge by former President of the VIMS Foundation E. Morgan Massey, we are on our way towards this goal and are working to raise the remainder. We hope many of our friends will join in this effort.

Private giving currently accounts for less than 2% of VIMS support. We realize this must grow for us to keep on the forefront of marine science. VIMS receives gifts directly as well as through the VIMS Foundation. Private giving for VIMS and the VIMS Foundation in FY 2010 amounted to 487 gifts totaling \$1,389,046. Of this, \$417,903 came through the VIMS Foundation.

This report shows how endowments created in the last decade benefit our education and research programs. Endowments in 2009-2010 made it possible for the VIMS Foundation to award 14 fellowships in the current academic year. Expendable gifts to the Foundation also provide critical support for scientific equipment. For example, additional gifts and grants in FY 2010 from the Norfolk Southern Foundation, the NewMarket Corporation, and the Elis Olsson Memorial Foundation allowed for purchase of various kinds of mass spectrometers in the labs of professors Aaron Beck, Iris Anderson, and Elizabeth Canuel and their students. The Keith Campbell Foundation for the Environment continued its support in two areas vital for those who care about Chesapeake Bay: submerged aquatic vegetation in Dr. Robert Orth's lab, and oyster research in Dr. Mark Luckenbach's lab at our Eastern Shore Laboratory in Wachapreague, Virginia.

The total assets of the VIMS Foundation were \$7,231,459 as of June 30, 2010, up from \$6,678,562 on June 30, 2009. The Foundation's endowed funds are invested with the William and Mary Investment Trust (WAMIT), a vehicle that is open to various foundations affiliated with the College. Investment results are summarized elsewhere in this report. While the VIMS Foundation is still young, in FY 2010 it was able to provide \$630,497 in support to the Institute and the School of Marine Science through various endowments and expendable funds.

We deeply appreciate the support of the many friends, alumni, foundations, and corporations listed here. Despite tough economic times, the percentage of our alumni who support VIMS has doubled in the last several years. Thanks to all alumni who have made gifts and also to those who have participated in our alumni receptions at scientific meetings. These are a wonderful way to link current students with distinguished alumni from all over the United States.

If you would like to make a gift to the VIMS Foundation or to include it in your estate plans to benefit faculty, students, and the work of VIMS, please call Dean and Director John Wells at 804-684-7102 or Anne Marshall in the VIMS Development Office at 804-684-7107.



L to R Marshall Acuff and VIMS Dean and Director John Wells

Acuff endowments: A lasting impact

Marshall Acuff (William & Mary, '62) has had a distinguished career as an international leader in investment strategy, research, and management. He is also the very definition of a graduate who gives back.

Growing up on Virginia's Eastern Shore, Marshall has a love of Chesapeake Bay. In 1982, he and his mother Margaret decided to support their beloved Bay by creating one of the very first endowments for VIMS.

A. Marshall Acuff, Sr., Memorial Endowment

The Acuff Endowment has now supported oyster disease research for 28 years. Acuff support has played a key role in the renewed commitment to native oyster restoration, and has leveraged federal funds and helped create jobs for Virginia citizens.

Ryan Carnegie, leader of the Shellfish Pathology Laboratory at VIMS, says, "Our whole team appreciates the flexibility Acuff support gives our program—the ability to rapidly respond to emerging questions, pursue bold new directions, and build the foundation for larger, extramurally funded projects."

Marshall says, "Being part of a family tied to the Bay and wanting to assure the economic health of the shellfish industries and people of the area, I felt that creating an endowment for VIMS was the way to honor my father in perpetuity."

A. Marshall Acuff, Jr., Professorship

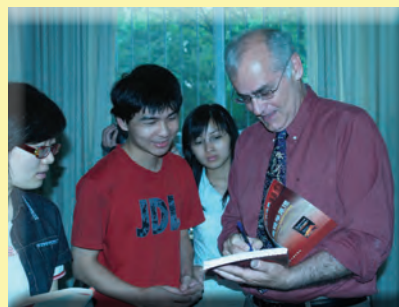
Marshall also created one of the first endowed professorships at VIMS. As a member of numerous College-affiliated boards including the VIMS Foundation, Marshall is aware of the need for long-term faculty support. Two distinguished professors have now held the post—emeritus professor Jack Musick and professor Michael Newman.

On the Acuff Chair, Musick published 52 peer-reviewed papers, wrote 3 trade books, and edited 8 scientific volumes. He also graduated 7 Master's and 9 Ph.D. students. Musick says "The Acuff Chair gave me an incentive to establish and maintain a standard of excellence in science that could be held as an example for my peers."

Dr. Michael Newman, appointed to the Acuff Professorship in 2008, is an expert in ecotoxicology, bioaccumulation, and ecological risk assessment. In recent years he has taught at universities in Vietnam, China, and Hong Kong as well as advising two Chinese students at VIMS. He completed two books during his first two years as Acuff Professor.

Dr. Newman says that being honored with the Acuff Professorship makes him more mindful of the example he must set for younger faculty and for students wherever their careers may take them.

On why he gives back so generously, Marshall says "Assuring that our students benefit from the very best faculty is a central part of our challenge as an institution. If the Acuff Professorship Endowment can contribute to attracting and keeping the very best scientists, it is doing a vital job for the College and VIMS."



Dr. Newman (R) at a recent book signing

Gift supports Antarctic research

A private gift from Adrian G. "Casey" Duplantier, Jr., matched by 1st Advantage Federal Credit Union of Newport News, supported another season of Antarctic field research for two local students—VIMS graduate student Kate Ruck and W&M undergraduate Sarah Giltz.

Ruck and Giltz joined VIMS colleagues for 6 weeks of field study in the coastal waters of Antarctica. Their study is part of the Long-Term Ecological Research (LTER) program at the U.S. Palmer Station on the Antarctic Peninsula.

Dinghy Poker Run

Two local chapters of the United States Power Squadrons raised more than \$3,000 for VIMS during the first annual "Dinghy Poker Run" on April 17th, 2010. The event was organized and hosted by the Colonial Sail and Power Squadron of Williamsburg and the Virginia Beach Sail and Power Squadron, with generous financial support from numerous local businesses.

During the event, boaters visited 4 marinas along the Chesapeake Bay waterfront (Wallace's Bait and Tackle, Dandy Haven Marina, Bell Isle Marina, and Salt Ponds Marina), choosing the best 5-card hand from the 7 cards they received. Prizes for winning hands were donated by Riverside Heating and Air, Bill Walsh and Bob Beltz, Martinee Walsh, and Bass Pro Shops. Participants also won gift cards to Wawa and ABC stores during a raffle. Artist Katie Moyers provided 7 limited-edition mermaid prints that were given as gifts to the top money raisers.

Keith Campbell Foundation helps VIMS restore marine life to seaside bays

Funds from the Keith Campbell Foundation for the Environment are helping VIMS researchers restore oysters, seagrass, and bay scallops to Virginia's seaside bays.

The 18-month project is a partnership between VIMS, The Nature Conservancy, the Virginia Marine Resources Commission, and the Virginia Coastal Zone Management Program. Restoration efforts are taking place within The Nature Conservancy's 38,000-acre Virginia Coast Reserve.

In addition to the Campbell Foundation, funds for the project come through NOAA as part of the American Recovery and Reinvestment Act. The funding—\$2 million in total—will provide 55 jobs in the Commonwealth for the duration of the project.

The restoration partnership will restore 30 acres of native oyster reefs at 15 sites; plant 100 acres of seagrass; and re-introduce 2.4 million juvenile bay scallops to the restored seagrass meadows.

Mark Luckenbach, Director of VIMS' Eastern Shore Laboratory, says "This integrated restoration program will greatly accelerate our collaborative efforts to restore these valuable coastal resources." VIMS professor Bob Orth adds "This project allows us to build on the success we've had with seagrass restoration in the Virginia coastal bays during the last decade, and now allows us to embark on a truly historic attempt to re-introduce the bay scallop." VIMS professor Ken Moore will monitor water quality in and around the restoration area.

NewMarket gift supports newest faculty member

A \$50,000 gift from NewMarket Corporation helped purchase a high-tech piece of lab equipment for Dr. Aaron Beck, VIMS' newest faculty member. Beck is using the instrument—an "inductively coupled plasma mass spectrometer"—to advance his studies of trace metals in groundwater. Discharge of metals such as iron, copper, lead, and zinc from submarine groundwater into Chesapeake Bay and the coastal ocean has important implications for aquatic organisms and marine chemistry.

Beck, a geochemist, arrived at VIMS in 2009 after serving a two-year post-doctoral fellowship at the Max Planck Institute for Marine Microbiology in Bremen, Germany.

Acquisition of scientific instrumentation is one of VIMS' most critical ongoing needs.

Olney Ichthyology Award

Gifts to the John Edward Olney, Sr. Memorial Endowment will support VIMS graduate student Jennifer Martin, the recipient of the inaugural John E. Olney, Sr. Ichthyology Award. The award honors the distinguished career of the late professor John Olney and his unwavering dedication to fostering young marine researchers and ichthyologists. Dr. Olney passed away on January 11, 2010 after a yearlong battle with cancer.

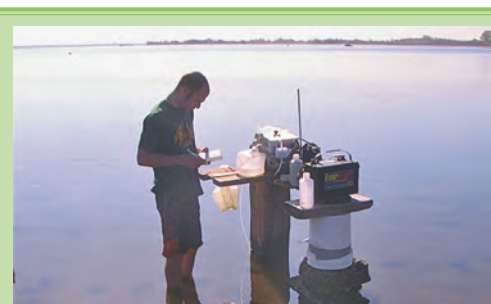
The intent of the Olney award is to celebrate Dr. Olney's life and accomplishments and inspire future scientists by supporting their pursuit of knowledge and professional growth. The award provides funds for participation in educational and professional development activities, including attendance at meetings, workshops, and special research opportunities in ichthyology.

Martin became a Ph.D. student at VIMS in 2008 to work with Dr. Olney on the taxonomy and distribution of the dealfishes and their relatives. Her work is particularly important and timely, as many of these fishes are caught as by-catch in fisheries around the world. Martin's work will help to accurately identify and manage these species.

Martin joined the faculty at Thomas Nelson Community College in 2005, where she continues to work full time as a Biology professor. She has worked tirelessly to maintain her teaching position while still making progress on her research.

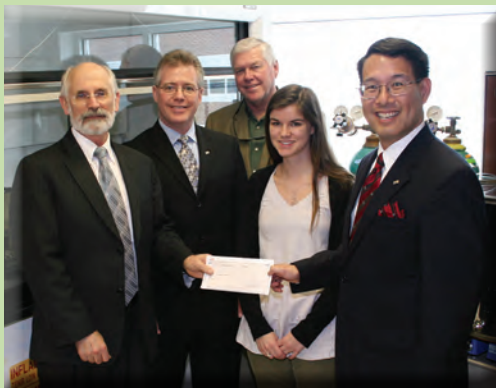


VIMS Foundation President Carroll W. Owens, Jr. presents the John E. Olney Ichthyology Award citation to John's family (L to R daughter Susan Napiecek, wife Lee Larkin and son John Jr. at the VIMS 2010 Maury Dinner).



Dr. Aaron Beck collects submarine groundwater for trace-metal analysis.

SunTrust gift supports VIMS graduate student



From L: VIMS Dean and Director John Wells, SunTrust Senior Vice President David Burris; Bill Hudgins, owner and president of Bill Hudgins Pontiac, GMC; VIMS graduate student Emily Jayne; and Bernie Ngo, City President SunTrust Bank Gloucester.

A fellowship from the SunTrust Mid-Atlantic Foundation will support climate-change research by Emily Jayne, a graduate student in the lab of professor Rebecca Dickhut at VIMS. Jayne was awarded the SunTrust Fellowship for both the 2009-2010 and the 2010-2011 academic years.

Jayne plans to use the fellowship to conduct field studies of volatile organic compounds and their role in the global and ocean carbon cycle. These compounds, produced mostly by land plants but also by human activities, include terpenes, substances released by pine trees

that lead to the hazy skies of a typical summer day along the East Coast. Jayne plans to conduct her fieldwork in Chesapeake Bay and the waters off Bermuda.

Bernard Ngo, President of SunTrust Bank, Williamsburg/Gloucester, says “We’re extremely pleased to be able to help provide fellowship support to Emily and other students at VIMS. The training they receive, and the work they do, helps us all by leading to a better understanding of the many serious issues facing Chesapeake Bay and the ocean.”

Sloan Foundation supports VIMS role in Census of Marine Life

Funding from the Alfred P. Sloan Foundation to the Census of Marine Life (CoML) has supported the research of several VIMS professors involved in this unprecedented global project. The first Census drew to a close in 2010, having marshaled 2,700 scientists from more than 80 nations to assess and explain the diversity, distribution, and abundance of life in the oceans. During the last decade, Census scientists mounted 540 expeditions, identified more than 6,000 potentially new species, and generated 2,600 scientific publications.

Professor Tracey Sutton was active in two Census projects—the Mid-Atlantic Ridge Ecosystem Project (MAR-ECO) and the Census of Marine Zooplankton. Among many other discoveries, his work led to resolution of a long-standing biological puzzle by showing that a group of deep-sea fishes previously classified into three separate families are actually the larvae, males, and females of a single family—the whalefishes.

VIMS adjunct professor Michael Vecchione, a MAR-ECO scientist and member of the MAR-ECO steering committee, has also been involved in Census projects in the Arctic and Antarctic, exploring seamounts, and synthesizing information from the deep sea. His work has led to discovery of several new species of deep-sea squid.



Tracey Sutton tagging snadbar shark

Both Sutton and Vecchione took part in a major news conference at the Royal Institution in London on October 4th 2010 to announce the final results of the landmark CoML effort.

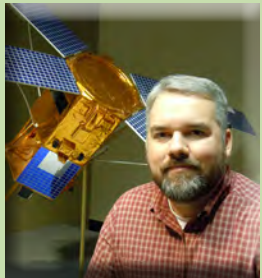
Professor Deborah Steinberg worked with collaborators at Woods Hole, the Russian Academy of Sciences, and the Smithsonian to provide the first-ever complete census of zooplankton diversity in the subtropical North Atlantic. Their efforts are part of a U.S. initiative to create an on-line database of marine animal and plant distributions called the Ocean Biogeographic Information System, another CoML project.

The Census not only advances knowledge about life in the global ocean, including the first ever complete catalog of marine life, but will serve to inform decisions about how to best manage the world’s marine resources.

Holmquist supports Annual Fund

Richard Holmquist is a man who knows about giving back, both to his country and to VIMS. His recent unrestricted, 5-year gift to the Annual Fund of the VIMS Foundation will be used to support the Institute's most pressing needs, whether they be a student stipend, faculty research, or purchase of cutting-edge scientific equipment.

Holmquist began his graduate studies at VIMS in 1994 after receiving his bachelor's degree in biology and history at William and Mary. In 1997, he put his graduate work on hold to command Virginia's 129th Field Artillery Detachment during their deployment to Bosnia-Herzegovina. Holmquist earned his Master's from VIMS in 2001, studying the population dynamics of Atlantic silversides with professor Herb Austin. His research, military training, and a stint as a NOAA



VIMS alumnus and annual giver Richard Holmquist with a model of the GeoEye OV-2 satellite

fisheries observer provided experience for his current position as Director of Sales for the Marine Services Group at GeoEye, Inc.

Headquartered in Dulles, Virginia, and with 530 employees worldwide, GeoEye provides satellite imagery, image-processing services, and GIS products to clients around the globe.

Holmquist directs global sales for imagery and products derived from GeoEye's OrbView-2 satellite, whose sensors provide worldwide coverage of ocean productivity. His sales

team services a wide range of markets, including commercial and sportfisheries, government agencies, and environmental organizations.

In addition to his support of the VIMS Foundation, Holmquist is working to raise awareness among VIMS researchers of potential partnerships with the GeoEye Foundation, which grants free imagery for use in environmental studies.

Holmquist says "I'm really grateful for the marine science education that I received at VIMS. It's my hope that I can repay the confidence that VIMS had in me by working in my current job to support the research community as well as government and industry—much like the mission of VIMS."

Summer interns complete marine research at Eastern Shore Lab

Five students from universities throughout the Commonwealth returned to their native Eastern shore this summer to pursue research at VIMS' Eastern Shore Laboratory in Wachapreague.



From L to R: Paige Smith, Lauren Rowan, Zachary Mallette, Cain Bonniwell, and Jessica Smith.

ESL Director Mark Luckenbach says he's "pleased that we have the opportunity, especially during these difficult economic times, to involve young people from the Shore in marine science." The program is supported through a subcommittee of the VIMS Council, chaired by A. Thomas Young, which for the second consecutive year was instrumental in raising the private funds needed for student support. Private donors are Marsha and Rick Amory, Cynthia Bailey, Chris and Kirkie Bosworth, Barbara and Steve Johnsen, the E. Polk Kellam Foundation, E. Polk Kellam, Jr. and Roberta Kellam, Caramine Kellam, Debbie and Pete Lalor, and Page and Tom Young. In addition, the H. M. Terry Seafood Co., Inc. and J. C. Walker Brothers, Inc., sponsored an internship focused on aquaculture research.

This year's interns were Lauren Rowan (Onancock) who examined the potential for oyster restoration within a small bayside creek; Cain Bonniwell (Belle Haven) who helped restore bay scallops to local seaside bays; Zachary Mallette (Locustville) who explored how clam aquaculture affects food webs in shallow-water habitats; Paige Smith (Harborton), who took part in a study of summer flounder; and Jessica Smith (Exmore), who contributed to a long-term study of the potential impact of endocrine-disrupting compounds on Eastern Shore oysters.

Rowan says her experience at the lab gave her "a serious respect for oysters, and a knowledge base that I never would have been able to acquire otherwise." Mallette says the experience expanded his knowledge of biological processes and provided "personal relationships that can guide me as I pursue my academic studies and passion for biology."

Summer Camps

The 2010 edition of the VIMS summer camp program brought big smiles to more than 100 local youngsters, who each spent a week at VIMS or its Eastern Shore Lab learning firsthand about the Bay or Virginia's seaside ecosystem. The 5 weeklong camps are made possible by a gift from an anonymous private donor to the VIMS Foundation. The gift will fund the summer camps at VIMS for five years (2009-2013).

Led by Education Coordinator Sarah McGuire of the Chesapeake Bay National Estuarine Research Reserve at VIMS, the camps provide fun, hands-on experiences in the field and lab to elementary and middle school students from in and around Gloucester County. One hundred and five students took part during the second season in 2010. Campers got wet and muddy at sites around the Bay, from the VIMS Teaching Marsh to the Goodwin Islands and the barrier islands of the Eastern Shore.

Sea Squirts - During the week, rising 1st and 2nd grade students learned about the many plants and animals that call Chesapeake Bay home. Students spent time in the VIMS Teaching Marsh, seining in the York River, visiting the Virginia Aquarium, and doing a variety of games and crafts. **Green Gurus** - Rising 3rd and 4th grade students spent the week learning about being green, including planting native species, recycling, how to have a waste-free lunch, and conserving energy. Students did wildlife mapping, seining, and took a trip to the Virginia Living Museum to explore the living greenhouse and conservation garden. Two sessions of this camp were offered. **Chesapeake Champions** - Rising 5th and 6th grade students focused on being good stewards of Chesapeake Bay. Students spent the week testing water quality, doing an oyster restoration project, canoeing, and seining. Students completed presentations for their parents on the main issues affecting the Bay. **Estuary Explorers** - This week-long overnight trip to the VIMS Eastern Shore Laboratory allowed rising 7th and 8th grade students to explore barrier islands and lagoons in depth. Students spent time canoeing, exploring barrier islands and mud flats, doing a squid dissection, trawling, dredging, and more. Students kept a science notebook with species lists, water-quality data, and observations from the field.

"Thanks for getting my son really excited about something other than sports and video games."

"It was so fun and it changed my life. I can't wait for the next one."

"It was one of my best times ever."

"Thanks for letting this camp exist. It's the best camp ever. My favorite thing was everything"



VIMS Foundation Fellowships

Fellowships and awards for students in the School of Marine Science at VIMS recognize and reward qualities that lead to success in graduate school and subsequent careers—including commitment, initiative, scholarship, and interdisciplinary research.

Hunter B. Andrews, Jr., Fellowships

Kristene Parsons, Ph.D. Student
Faculty Advisor Tracey Sutton

Shark assemblage structure and biogeographic distribution in Chesapeake Bay and coastal Virginia



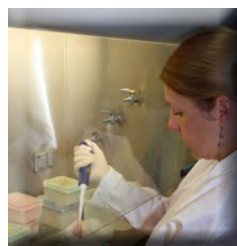
Kristene Parsons

Edward M. Holland Fellowship

Lori Sutter, Ph.D. Student
Faculty Advisor Jim Perry

Vegetative community nutrient uptake along the York River salinity gradient: Implications of rising sea level

Lori Sutter



Wenda Ribeiro Quidort

Wenda Ribeiro Quidort, Ph.D. Student
Faculty Advisor Kimberly Reece

Detection and identification of adenovirus in local estuarine waters receiving waste water effluent and in shellfish tissue harvested from these waters.

Kathryn Sobocinski, Ph.D. Student
Faculty Advisors Rob Latour & Emmett Duffy

Fish-mediated export from eelgrass beds in lower Chesapeake Bay



Kathryn Sobocinski



Richard Secrist

Grey Allison & H. Renwick Dunlap Fellowship

Richard “Gar” Secrist, M.S. Student
Faculty Advisors Mark Luckenbach & Iris Anderson
Clam aquaculture in Cherrystone Creek

Ferguson Enterprises Fellowship

Christina Pondell, Ph.D. Student
Faculty Advisor Elizabeth Canuel

The effects of changes in land-use and climate on organic carbon accumulation in reservoirs



Christina Pondell

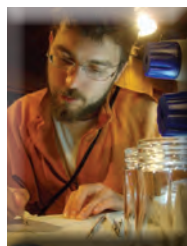


Alison Deary

Beazley Fellowship

Alison Deary, M.S. Student
Faculty Advisor Eric Hilton

Habitat differentiation, development of feeding apparatus, and sensory development during the ontogeny of larval sciaenids in Chesapeake Bay



Matt Whalen

Harry and Barbara Hager Fellowship

Matthew Whalen, M.S. Student
Faculty Advisor Emmett Duffy

Identifying the role of mesoherbivory in seagrass systems.

Juliette B. and Carroll W. Owens, Sr. Fellowship

Erin Jenkins, M.S. Student
Faculty Advisor Jeffrey Shields

Parasite biology in local crustacean populations



Erin Jenkins

SunTrust Fellowship

Emily Jayne, M.S. Student
Faculty Advisor Rebecca Dickhut

*Development of methodology for quantifying air-sea
fluxes of volatile organic carbon*



Emily Jayne

Kathleen and Robert Roper Fellowship

Julia Moriarty, M.S. Student
Faculty Advisor Courtney Harris

*Formation and reworking of flood
deposits on the Waipaoa River shelf,
New Zealand: variability in sediment
transport and deposition*



Julia Moriarty



Ryan Schloesser

Zeigler Fellowship

Funded primarily by Charles Natale, Jr.
Ryan Schloesser, Ph.D. Student
Faculty Advisor Mary Fabrizio

*Changes in the distribution and abundance of non-
indigenous species in Chesapeake Bay based on
trawl surveys*



Andre Buchheister

Virginia Institute of Marine Science Council Fellowship

Andre Buchheister, Ph.D. Student
Faculty Advisor Robert Latour

*Food web dynamics and community structure of
demersal fishes in Chesapeake Bay*

The George P. Coleman Bridge with VIMS in the right background.



VIMS Foundation Audited Financial Statements

Statement of Financial Position June 30, 2010

Assets	
Current Assets	
Cash and cash equivalents	\$ 627,443
Pledges receivable	\$ 124,750
Total Current Assets	\$ 752,193
Investments	\$ 6,367,042
Other Assets	
Pledges receivable	\$ 112,224
TOTAL ASSETS	\$7,231,459
Liabilities and Net Assets	
Grants payable	\$ 16,528
Net Assets	
Unrestricted	\$ 575,325
Temporarily restricted	\$ 2,205,338
Permanently restricted	\$ 4,434,268
Total Net Assets	\$ 7,214,931
TOTAL LIABILITIES AND NET ASSETS	\$7,231,459

Statement of Activities for the Year Ended June 30, 2010

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Revenue, Gains, and Other Support				
Contributions	\$ 208,295	\$ 74,858	\$ 134,750	\$ 417,903
Net Investment Income (Loss)	\$ 305,603	\$ 472,950	-	\$ 778,553
	\$ 513,898	\$ 547,808	\$ 134,750	\$ 1,196,456
Net assets released from restrictions	\$ 461,042	\$ 461,042	-	-
Total Revenue, Gains, and Other Support	\$ 974,940	\$ 86,766	\$ 134,750	\$ 1,196,456
Expenses				
Accounting and Legal	\$ 17,670	-	-	\$ 17,670
Bank Fees	\$ 5,939	-	-	\$ 5,939
Grants and Support	\$ 630,497	-	-	\$ 630,497
Taxes and Licenses	\$ 1,199	-	-	\$ 1,199
Insurance	\$ 4,279	-	-	\$ 4,279
Office Expenses	503	-	-	503
Total Expenses	\$ 660,087	-	-	\$ 660,087
Change in Net Assets	\$ 314,853	\$ 86,766	\$ 134,750	\$ 536,369
Net Assets, Beginning of Year	\$ 260,472	\$ 2,118,572	\$ 4,299,518	\$ 6,678,562
NET ASSETS, END OF YEAR	\$ 575,325	\$ 2,205,338	\$ 4,434,268	\$ 7,214,931

William & Mary Investment Trust (WAMIT)

WAMIT delivers solid performance in 2010

Approximately two-thirds of William & Mary's endowed assets are invested through the William & Mary Investment Trust (WAMIT), including the investable assets of the Virginia Institute of Marine Science Foundation. For fiscal year 2010, WAMIT outperformed its market benchmark by 1.1 percentage points. Investment results over the past three and five years outperformed benchmarks as well, by 3.6 and 3.5 percentage points respectively.

W&M's Chief Investment Officer Brian Hiestand says WAMIT's solid performance in fiscal 2010 is due in large part to its continued advocacy of a "total return" approach, which focuses on the long term by aiming to preserve WAMIT's purchasing power while providing areas of the College with a predictable and growing stream of spending distributions. This approach focuses on equity and equity-like return strategies, but allows the ability to make opportunistic investments when appropriate and the flexibility to make adjustments in asset allocation if warranted by market conditions.

Factors in fiscal 2010's success included a continued emphasis on Emerging Market Equity securities and a decision, beginning in fall 2008, to make an opportunistic allocation to distressed credit investments. Another reason 2010 was so fruitful for WAMIT, Hiestand says, was its selection of strong investment managers, many of whom outperformed their respective benchmarks.

"The global financial markets remain challenging," says Hiestand, who in 2010 was recognized as one of the country's top 10 university endowment managers by 24/7 Wall St., an online source for financial news and commentary. "We are fully engaged to help preserve the purchasing power of the assets that have been entrusted to us by exercising prudent investment judgment. We have an eye toward managing the downside volatility and are only making investment allocations when the returns far outweigh the risks involved."

Participants in WAMIT include The College of William & Mary Foundation (CWMF) and the foundations associated with the Mason School of Business, William & Mary Law School, and VIMS. All WAMIT participants have the same exposure to all asset classes and investment managers, and each is allowed to determine its own spending rate policy.

By pooling assets under this single structure, WAMIT—which formed in 2004—offers a well-diversified portfolio with a record of strong investment performance, along with administrative and investment oversight through a highly experienced Investments Administration staff as well as CWMF's 12-member Investments Committee.

INVESTMENT RESULTS

As of June 30, 2010 — Net of all fees

	1 YEAR	2 YEARS	5 YEARS
The William & Mary Investment Trust (WAMIT)	14.1%	-2.2%	4.9%
Blended Benchmark	13.0%	-6.5%	1.4%
Value Added	1.1%	4.3%	3.5%

Policy Benchmark: 60% Russell 3000 Index, 20% MSCI World ex-U.S. Index, 20% Barclays Capital Aggregate Bond Index

THE WILLIAM & MARY INVESTMENT TRUST: ASSET ALLOCATION OF POLICY PORTFOLIO

Fiscal Year 2010

June 30, 2010
ALLOCATION

Domestic Equities	16.2%
Foreign Equities	9.1%
Emerging Market Equities	8.3%
Fixed Income	12.1%
Special Situations	16.7%
Absolute Return	14.5%
Real Assets	8.0%
Private Equity	4.9%
Cash	10.2%



Donors & Supporters

In the fiscal year July 1, 2009 - June 30, 2010, VIMS and the VIMS Foundation received 487 gifts totaling \$1,389,046. We sincerely thank all donors and recognize members of the Maury Society, who make annual leadership gifts of \$1,000 or more, and VIMS Pathfinders, for their generous lifetime commitments to research, education, and advisory service in marine science.

Pathfinders

The Virginia Institute of Marine Science is proud to recognize the following individuals, corporations, and foundations that have generously supported its work with lifetime gifts of \$100,000 or more.

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The Maury Society

Named for the "Pathfinder of the Seas" Matthew Fontaine Maury, the Maury Society recognizes donors who make an annual gift of \$1,000 or more. This group of dedicated patrons helps VIMS to continue Maury's tradition of scientific discovery.

\$100,000 Plus

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Mr. Dexter S. Haven

In honor of gift to VIMS:

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Mrs. Candy Campbell

In memory of Dr. John E. Olney, Sr. for the Dr. John E. Olney, Sr. Ichthyology Award Endowment:

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memory of Mr. Russell Wessells

A Note to Our Donors

The Virginia Institute of Marine Science values all forms of support for its tripartite mission of research, education, and advisory service. We are especially appreciative of the efforts of the many alumni and friends who volunteer at VIMS.

This report includes donors whose gifts were received between July 1, 2009 and June 30, 2010. We apologize for any errors or omissions, and hope you bring them to our attention. Please report corrections to Lisa Phipps, Office of Development, Virginia Institute of Marine Science, P. O. Box 1346, Gloucester Point, VA 23062, (804) 684-7099, lcship@vims.edu.

In memory of gift to the Eastern Shore Lab:

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In memory of gifts to the VIMS Student Awards and Scholarships:

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In memory of gift to the William J. Hargis, Jr. Library Endowment:

The Employees of VIMS' Center for
Coastal Resources Management in
memory of Mr. Abraham Berman

* Deceased

VIMS Financials FY 2009-10

Unaudited

REVENUE

General Funds	\$17,776,971
Non-general Funds	
Tuition and Other Funds	1,735,439
Grants & Contracts	22,168,374
Private Funds	836,849
Total Revenue*	\$45,517,633

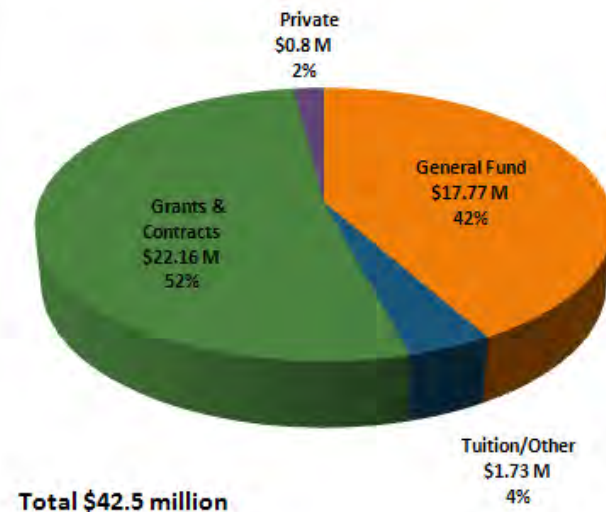
EXPENDITURES

Instruction	\$1,639,833
Research and Advisory Services	8,479,537
Public Service	20,282
Academic Support	4,176,540
Institutional Support	2,208,069
Plant Operations	3,503,961
Student Financial Assistance	321,037
Sponsored Programs	22,168,374
Total Expenditures	\$42,517,633

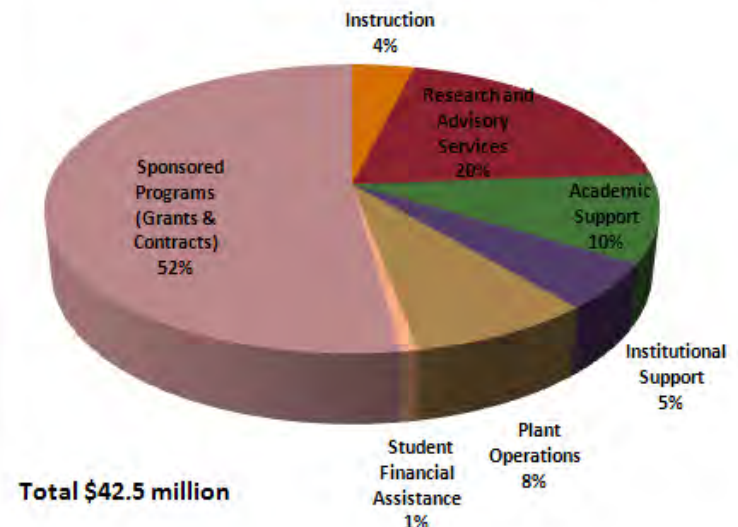
CAPITAL EXPENDITURES \$2,475,375

* Revenue includes grants and support to VIMS from the VIMS Foundation

FY 2009-10 Revenue



FY 2009-10 Expenditures



Grants and Contracts

VIMS researchers were awarded \$21.3 million by federal, state and private entities during fiscal year 2009-2010. The reason that this value (\$21.3M) differs from the \$19.1M value in the pie chart below is that the \$21.3M is the total amount awarded, whereas the \$19.1M is the total of expenditures (e.g., not all monies awarded in FY 2010 were spent in FY 2010.) In addition to supporting critical research and oversight activities within the Commonwealth, these grants and contracts provided opportunities to enhance educational programs and conduct cutting-edge research nationally and internationally. A few highlights include:

Deborah Bronk, “Does competition for nitrogen between autotrophs and heterotrophs control carbon fluxes in the Western Coastal Arctic?” NSF, \$390,827

Elizabeth Canuel, “Collaborative research: constraining the sources, ages and alteration of dissolved and particulate lipids in estuarine and coastal organic matter,” NSF, \$361,572

Emmett Duffy, Elizabeth Canuel, and collaborators at W&M and elsewhere, “Algal biofuel research,” Statoil, \$1,922,000

Rebecca Dickhut, “Persistent organic pollutants in the Antarctic marine food web: impact of climate change and insights into the feeding ecology of apex predators,” NSF, \$275,000

Carl Hershner, Marcia Berman, and **Kirk Havens**, “Strengthening Virginia’s wetlands management programs,” EPA, \$394,732

Eric Hilton and **Tracey Sutton**, “Renovation of the Ichthyology Collection and associated facilities at VIMS,” NSF, \$311,993

Mark Luckenbach, “Seaside Special Area Management Plan:

spatial information analysis and interpretation for shellfish grounds and SAV beds,” NOAA, \$77,972

Roger Mann, “Collaborative research: climate change and responses in a coupled marine system,” NSF, \$99,999

Kenneth Moore, “Commonwealth water quality monitoring for Bay water quality standards assessment,” EPA, \$408,196

Jeffrey Shields and **Jessica Small**, “Connectivity and disease in marine environments: multi-scale dynamics of a viral disease in Caribbean spiny lobster,” NSF, \$302,873

Walker Smith and **Marjorie Friedrichs**, “Collaborative research: seasonal evolution of chemical and biological variability in the Ross Sea,” NSF, \$831,131

Deborah Steinberg, “Collaborative research: Amazon influence on the Atlantic: carbon export from nitrogen fixation by diatom symbioses,” NSF, \$399,581

Robert Diaz, “Report: land-based activities and coastal and marine hypoxia,” UN Food and Agriculture Organization, \$10,000

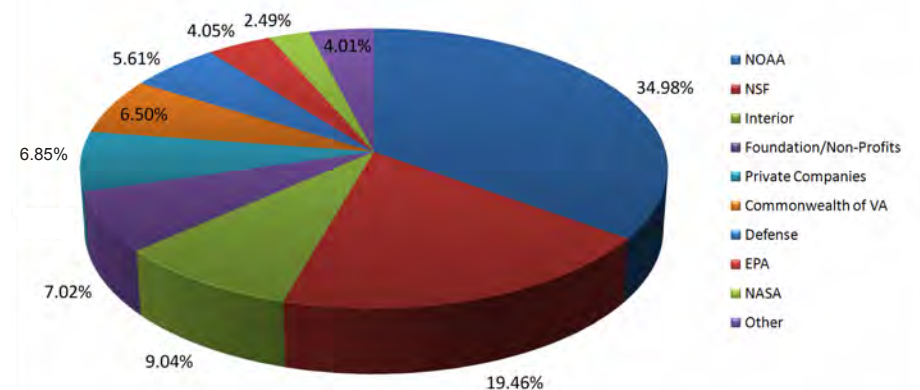
James Kirkley and **Thomas Murray**, “Estimate and assess social and economic importance and value of menhaden to Chesapeake Bay stakeholders and region (Year 3),” VMRC, \$154,452

Michael Newman, “Floodplain biomagnification and probabilistic exposure modeling, and synthesis report,” E. I. du Pont de Nemours and Company, \$184,099

Michael Vecchione and **Tracey Sutton**, “Patterns and processes of the ecosystems of the northern Mid-Atlantic (MAR-EC0),” Sloan Foundation, \$600,000

Harry Wang and **Jian Shen**, “Assessing Risks of coastal inundation using VIMS ELCIRC modeling system,” Northrop Grumman Newport News Shipbuilding, \$168,583

VIMS External Funding Expenditures FY 2009-2010



Total = \$19.1 million



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Members of the Virginia House of Delegates' Chesapeake Subcommittee visited VIMS to explore issues facing Chesapeake Bay and its watershed. From L: VIMS Dean and Director John Wells, with delegates Harvey Morgan, David Bulova, Margaret Vanderhye, Lynwood Lewis, Jr., Brenda Pogge, Edward Scott, R. Lee Ware, Jr., Beverly Sherwood, and Matthew Lohr.

Protect the Bay and Planet for our Children: Support VIMS and the VIMS Foundation!





Save the Date

Marine Science Day Open House - May 21, 2011



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