IMPACT REPORT

2015-2020

SCIENCE FOR THE BAY,
IMPACT FOR THE WORLD

VIMS | William & Mary
Virginia Institute of Marine Science

Inside

FROM THE DEAN AND DIRECTOR

Five years ago, VIMS charted a course for the future with an ambitious strategic plan and launched the public phase of a bold fundraising campaign alongside William & Mary. Both exceeded expectations. Our success was accomplished through the vision and support of people like you, and I'm pleased to share our progress in this Impact Report.

I'm grateful for the leadership of A. Marshall Acuff, Jr., who helmed the *For the Bold* campaign at VIMS and who helped us achieve many of these milestones.

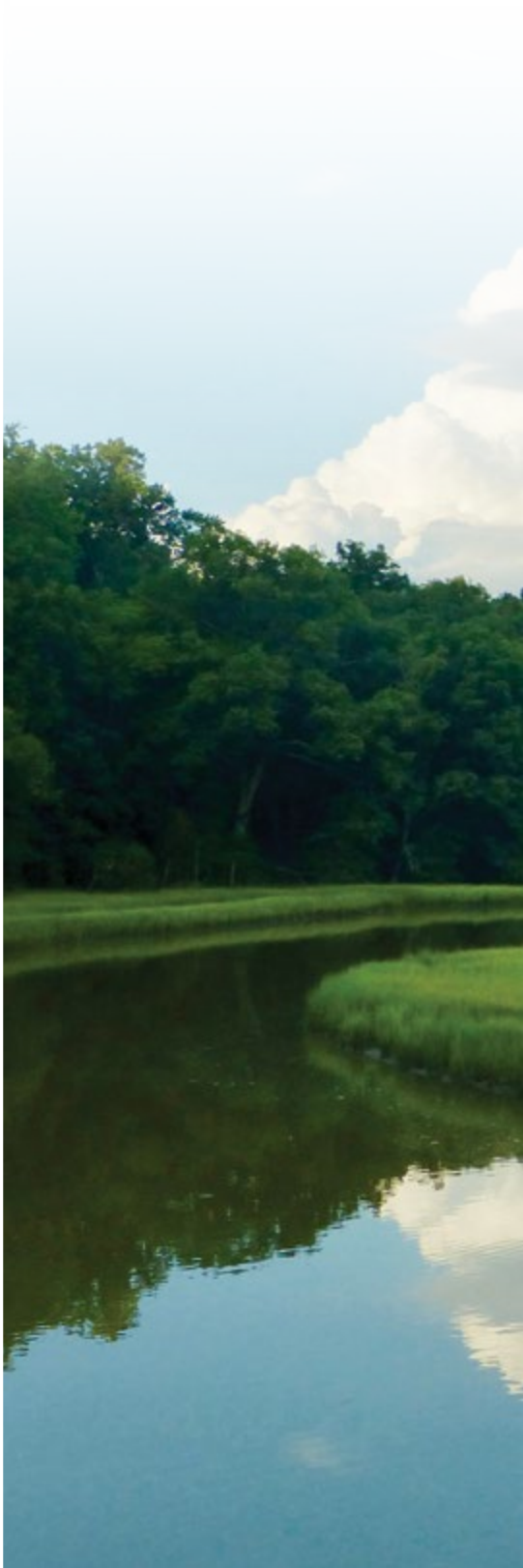
While there is much to celebrate, I am particularly pleased to call your attention to the story on page 20 in which we announce the new Acuff Center for Aquaculture.

Whether you are a supporter who shares our passion for the water, a partner organization or agency with a stake in our mission, an alum sharing your leadership and learning with the world, one of the dedicated individuals who work, volunteer, and study here, or one of the visionary Foundation Board members elevating VIMS through your service and generosity, you have a share in our success.

Thank you. We have accomplished much over these five years and we stand poised to achieve much more.

And so we go.

John T. Wells
Director, Virginia Institute of Marine Science
Dean, William & Mary School of Marine Science



A BOLD MOVE FORWARD

In 2015 — our 75th anniversary — VIMS established a five-year strategic plan with six ambitious goals. In this Impact Report, we are proud to highlight our achievements and celebrate you, our supporters, whose impact on our mission is immeasurable.

STRATEGIC PLAN GOALS

1. UNDERSTANDING GLOBAL CHANGE
2. BUILDING COASTAL RESILIENCE
3. ENHANCING THE ECONOMY
4. EDUCATING MARINE LEADERS
5. EMPOWERING OUR PEOPLE
6. BROADENING OUR IMPACT

FROM THE PRESIDENT OF THE VIMS FOUNDATION

Through the years I have gazed out to the Catlett Islands and wondered at the changes time and tide have brought to my part of the York River. As people who love the water, I know you understand that feeling when a stretch of river or bay becomes your own. I'm also certain that you have been witness to change. Whether it's the ghost trees of the Catlett Islands, the erosion of your shore, the increase in plastic pollution, the immersion of your backyard in storm water, or the decline of a species of your favorite fish, you can't help but see it everywhere.

It was seeing this change that prompted me to get to know VIMS. I started to look into what VIMS scientists were studying and how it was relevant to my backyard. As I started to understand the impact that VIMS research was having on the marine environment that inspires me, I understood that I could play a role in championing VIMS and the Chesapeake Bay by serving on the VIMS Foundation Board. VIMS is one of the most respected marine institutes in the world and as president of the VIMS Foundation, it is my privilege to serve as its chief advocate.

I am delighted to offer this report on what we have been able to accomplish together and to share the VIMS Foundation's financials that demonstrate our growth and our strength.

Phyllis Cothran

Phyllis L. Cothran
President, VIMS Foundation Board
FY19-FY20

> "VIMS is one of the most respected marine institutes in the world and as president of the VIMS Foundation, it is my privilege to serve as its chief advocate."

VIMS' research on marine microplastics extends to the Gulf of Alaska.

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In 2016, the VIMS Council and the VIMS Foundation merged to form the current VIMS Foundation.

See page 45 for more.

$26.5M

In 2015, VIMS announced it had surpassed its original $15 million goal as it embarked on the public phase of William & Mary's *For the Bold* campaign. Thanks to thousands of generous donors, VIMS achieved unprecedented success, raising $26,464,484 by the end of the campaign.

6,107

TOTAL CAMPAIGN SUPPORTERS

WHO GOT US THERE?

4,428 COMMUNITY
323 VIMS ALUMNI
197 VIMS FACULTY & STAFF
863 W&M ALUMNI
296 CORPORATIONS/FOUNDATIONS

$25,000

CHALLENGE MONEY AWARDED TO VIMS FOR SUCCESS ON W&M'S DAY OF GIVING FROM THE VIMS FOUNDATION AND GERDELMAN SCHOOL & UNIT COMPETITION

See page 44

Sculpted by Eastern Shore artists William and David Turner, "Generations: A Family of Dolphins" was graciously brought to VIMS by Stephen Johnsen HON '18 and Barbara Johnsen Ed.S. '90, Ed.D. '95 and dedicated April 12, 2018.

No. 1

VIMS' GOAL TO BE FIRST IN SUSTAINABLE SHELLFISH AQUACULTURE IS WITHIN REACH, THANKS TO MARSHALL ACUFF'S LIFETIME OF GIVING. See page 20

8 and Counting

EPISODES OF OUR "DEEPER DIVE" VIDEO SERIES, A GIFT FROM JIM AND ANNE "BOOTSIE" MCCRACKEN ROGERS

See page 42

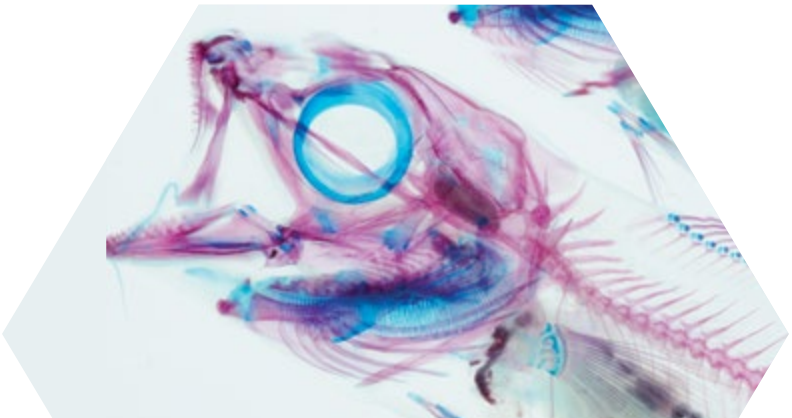
22

NEW ENDOWED GRADUATE FELLOWSHIPS

See page 31

27

STUDENTS TRAVELING ON ANTARCTIC RESEARCH VOYAGES SUPPORTED BY KAY AND ADRIAN "CASEY" DUPLANTIER, JR., WITH MATCHING FUNDS FROM 1ST ADVANTAGE FEDERAL CREDIT UNION



500,000

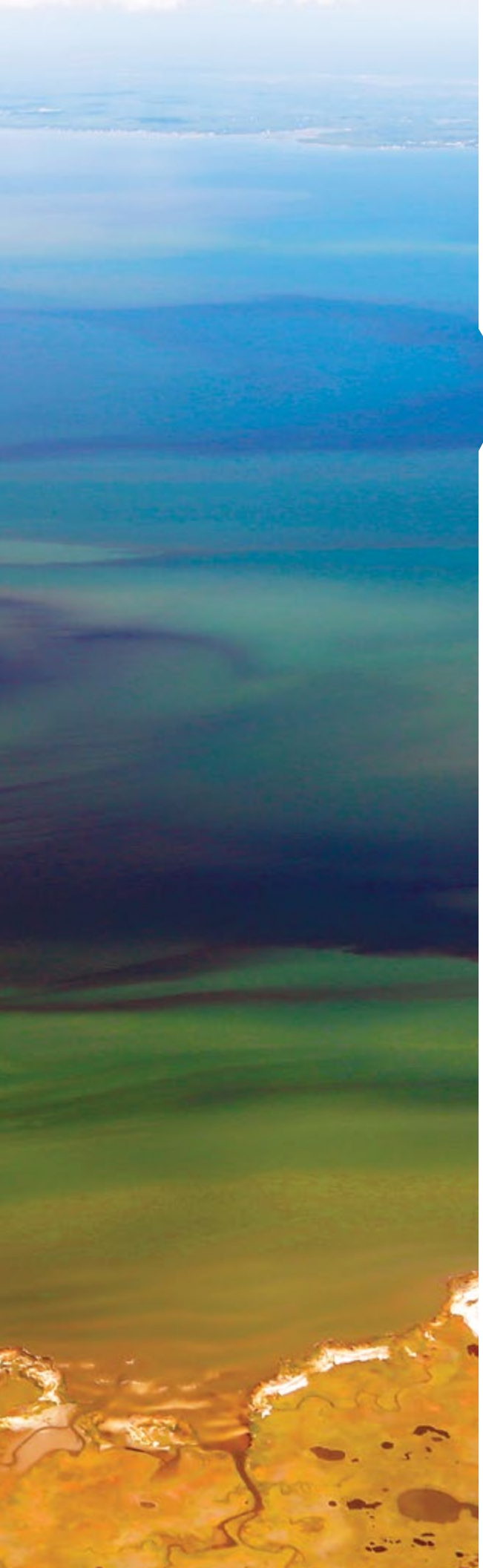
SPECIMENS IN THE NUNNALLY ICHTHYOLOGY COLLECTION, WHOSE ENDOWMENT REACHED $1 MILLION DURING THE CAMPAIGN.

See page 40

1

UNDERSTANDING GLOBAL CHANGE

VIMS is deploying multidisciplinary teams — enhanced by stellar junior faculty — to investigate the effects of global change and develop pioneering strategies in response.



The "O" in H_2O

VIMS' annual "Hypoxia Report Card" grades water quality in the Chesapeake Bay

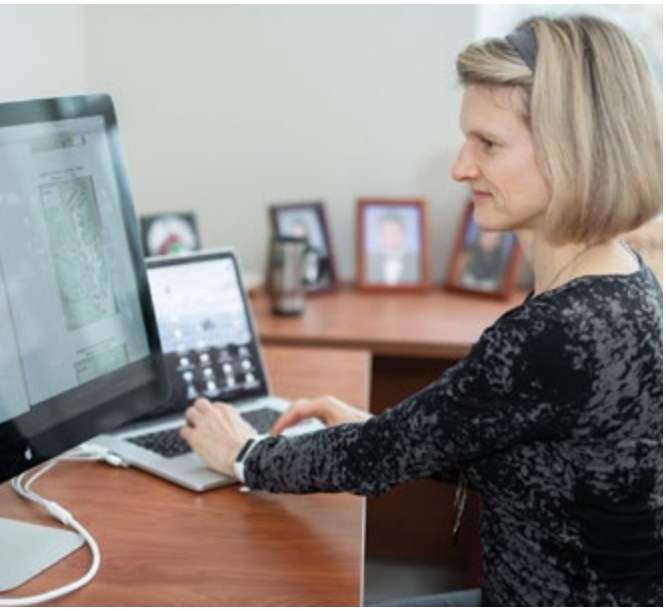
Like terrestrial creatures, marine organisms need oxygen to survive. Because there's far less oxygen in water, however, and it diffuses far more slowly, even small decreases have a big impact on the marine food chain.

VIMS pioneered the global study of so-called "dead zones" — low-oxygen waters — which have doubled in frequency each decade since the 1960s. These hypoxic areas are prevalent in the Chesapeake Bay throughout the summer.

To aid policymakers, VIMS introduced an annual "Hypoxia Report Card" for the bay in 2017. The report card was created by VIMS Research Professor Marjy Friedrichs with her former postdoctoral investigator, Aaron Bever Ph.D. '10 of Anchor QEA consulting company.

The report cards are based on forecast models developed by Friedrichs, Bever, and University of Maryland Professor Raleigh Hood. They incorporate real-time information as well as historical data collected by VIMS since 1985. "Observations collected only every two weeks can miss some important high-frequency changes. That's what we bring to the table," Friedrichs says. She notes that charter boat captains especially appreciate the daily "NowCast" to find the best spot for stripers.

VIMS is a national leader in studying harmful algal blooms (HABs), which can pose a danger to marine life and human health.

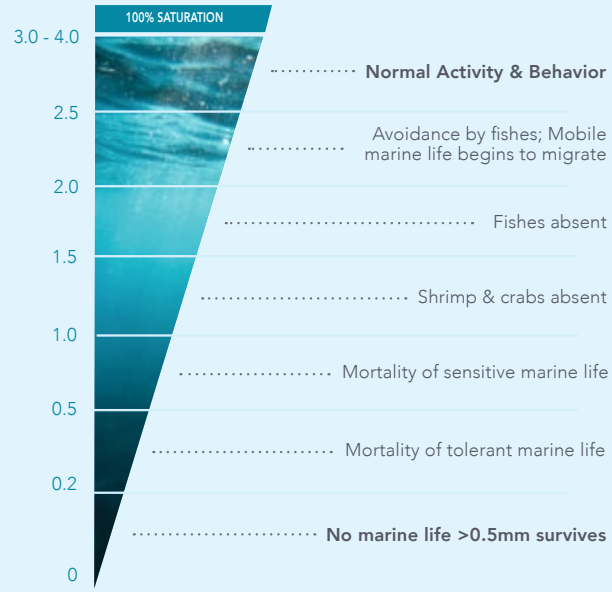


The report offers invaluable comparative data: for example, state environmental agencies can see whether efforts to reduce fertilizer runoff, a major culprit in causing hypoxia, have been effectively improving water quality. However, the situation is complicated by the changing climate.

"Observations collected only every two weeks can miss some of these important changes. That's what we bring to the table."

"What I'm most interested in, and the ultimate question, is trying to figure out how much of the change we're seeing in the bay is due to management actions and how much is due to climate change," Friedrichs says. "Warming in particular is causing there to be less oxygen in the water. So we're

OXYGEN LEVELS (MG/L) AND THEIR EFFECTS ON MARINE LIFE



Marjy Friedrichs (top left) leads a team quantifying the impacts of climate and land-use changes on the Chesapeake Bay.

using a mechanistic model to try to tease apart the counteracting forces."

"Sea-level rise is also very interesting," she adds. "More ocean water brings more oxygen, but it also brings more salt, which limits mixing, so you can't get as much oxygen down to the bottom."

Friedrichs and Hood are also beginning work on harmful algal bloom forecasts — drawing on VIMS' leading research on HABs (see page 12). "I like to emphasize that it's a partnership between Virginia and Maryland," Friedrichs says. "From a data standpoint, it's one bay. There's no wall in between."

SEAGRASS IN AUSTRALIA

When Professor Gary Kendrick of the University of Western Australia began a seagrass restoration project back in 2013, he knew exactly who to call — VIMS Professor Robert "JJ" Orth. "JJ is an elder in seagrass research, one of the top in the world," Kendrick says. "And he's such a positive fellow."

The project, supported by the Australian government and corporate funding, has resulted in a long-term collaboration with significant implications for threatened seagrasses worldwide. The group led by Kendrick and Orth just published exciting new findings in Nature's *Scientific Reports* on the evolutionary benefits of winged seeds in species of Australian seagrass. "Understanding the basic biology of seeds allows us to optimize our restoration practices," says Kendrick. "We've been incredibly successful in figuring out the science."

Professor JJ Orth preparing to dive off Rottnest Island in Western Australia.

"VIMS focuses on hiring interdisciplinary cohorts of scientists who are adept at collaborating across research areas to produce cutting-edge science. Since 2015, we have welcomed nine outstanding new faculty members to our ranks."

— JOHN WELLS, VIMS DEAN AND DIRECTOR

Assistant Professor Juliette Smith launches the Imaging FlowCytobot off the VIMS pier. Eventually she hopes to deploy a network of cytobots across the Chesapeake Bay.

CREATING A HAB EARLY WARNING SYSTEM

First described as red tides, harmful algal blooms — HABs — are increasing around the world. VIMS scientist Juliette Smith aims to create an early warning system to protect marine and human life from toxins that HABs can produce. She's been given a powerful boost to her work by VIMS supporters Harry and Judy Wason, who funded a state-of-the-art Imaging FlowCytobot to help Smith identify harmful algal species in real time. Smith is now leading a multi-institutional team, supported by a major NOAA grant, working to develop early warning systems in major U.S. shellfish harvesting sites. "The Wasons have given Juliette and her team the technology that will establish them on their long-term career trajectories," says Dean and Director John Wells. "It's an amazing gift."

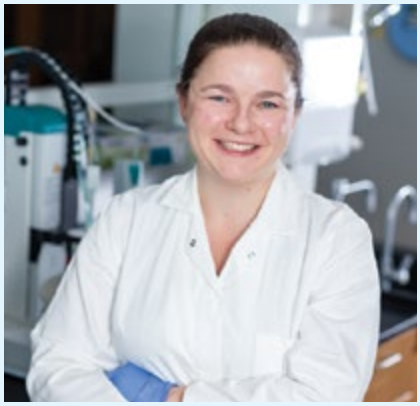
TRAINING CITIZEN SCIENTISTS

Marine organisms are subject to daily changes in water temperature and acidity, sometimes extreme. How will this influence their future response to global change?

That's the question Assistant Professor Emily Rivest is working to answer. Since coming to VIMS in 2016, she's expanded her research from the colorful coral reefs of French Polynesia to the oysters of the Chesapeake Bay. "The landscape here for ocean acidification is really unique — and that means it's a new frontier," Rivest says.

Rivest is taking a multi-pronged approach, including measuring actual conditions in the bay. She's also set up a sophisticated aquarium system to simulate future temperature and/or pH conditions. "It's like a crystal ball," she says.

With support from the Dominion Energy Foundation and NOAA, she's had a small army of



"citizen scientists" from area high schools to help with data collection. In turn, Rivest helps these young people to learn scientific methods and appreciate the effects of environmental conditions on local oysters.

"Our research has a lot of connection to aquaculture and restoration," Rivest says. Farther down the road, growers may be able to custom-design water conditions to maximize success. "It's a glimmer in the eye of where this really exciting research could lead."

RESPONDING TO SEA-LEVEL RISE

Associate Professor Matt Kirwan '02 has received many accolades, but the most recent topped them all — this past July, he was honored by the White House with the Presidential Early Career Award for Scientists and Engineers. Investments in his work from the Herndon Foundation helped pave the way for his success.

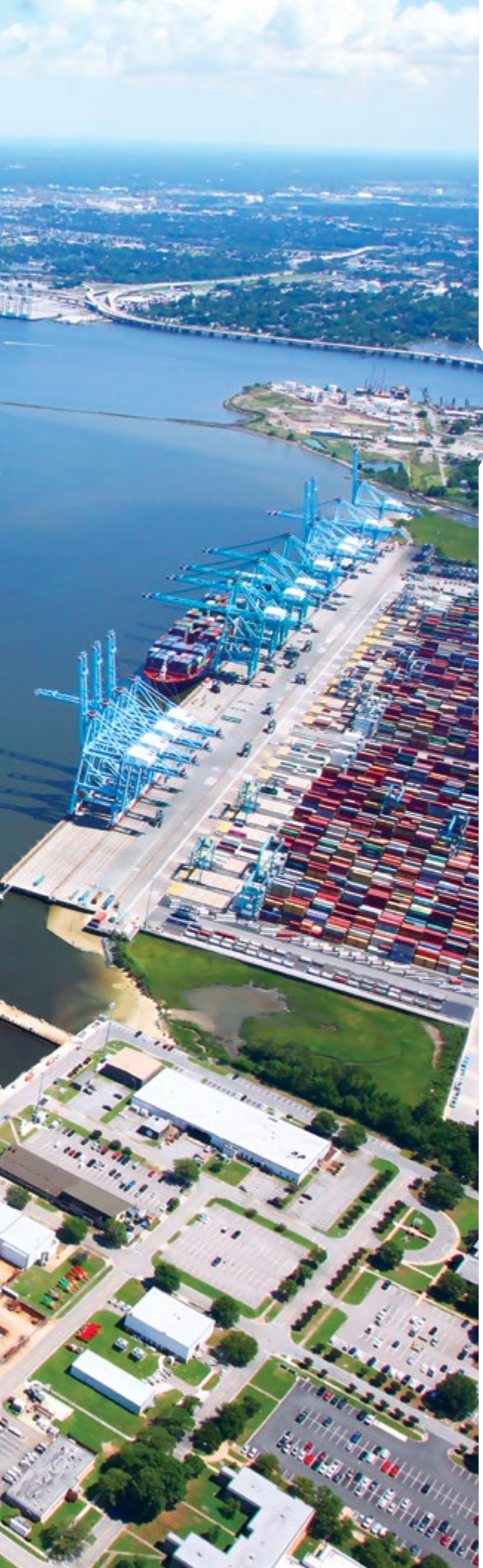
Kirwan's current research, which encompasses field, laboratory, and classroom activities, focuses on how the carbon stored in coastal marshlands will respond to sea-level rise. Through the educational component, he is working with local community college students and Indian tribes. "Matt's a scientific rock star," says former VIMS professor Deborah Bronk, now CEO of Bigelow Laboratory. "His stellar research brings benefits to the Chesapeake Bay and the nation."

Matt Kirwan's research on coastal marshes and "ghost forests" created by sea-level rise has garnered national media attention.

2

BUILDING COASTAL RESILIENCE

As the economic, environmental, and human costs of sea-level rise begin to mount, VIMS' cutting-edge research provides essential tools for communities to adapt and thrive.



The Wave of the Future

VIMS' flooding forecast models break new ground

"All ocean processes are interrelated, from the small-scale, like turbulence, to large-scale," says VIMS Research Professor Joseph Zhang. "If you want to simulate these processes in a holistic fashion, it's a huge challenge."

Zhang is the lead developer of the SCHISM cross-scale computer modeling system, a suite of models designed to more precisely forecast the movement of the world's waters, from tsunamis to storm surge. It is fast and highly accurate, simulating how waters flow through time and three-dimensional space. "SCHISM occupies a unique place," he says. "It's one of the few models that accommodates creek to ocean. We know by talking to researchers and managers, that's exactly what they want."

In addition to physical processes, SCHISM can simulate biological processes such as the life cycle of vegetation. Its broad applications include EPA water-quality studies to mitigate hypoxia and future predictions of the impact of Antarctic ice melt.

Zhang worked with an international team for two decades to develop the modeling system. "One of the things that we pride ourselves on is our open attitude. We never walk away from a suggestion," Zhang says. "It's a collaborative — that's the beauty of open source."

Today, SCHISM is widely considered the best of its kind in the world. Zhang regularly travels to sites in the U.S.

Virginia's Hampton Roads region is experiencing the highest rates of sea-level rise on the East Coast.

VIMS Research Professor Joseph Zhang is the lead developer of the SCHISM modeling system.

and abroad to provide training in the modeling system's use.

Closer to home, Research Assistant Professor Derek Loftis Ph.D. '14, who applied elements of the SCHISM modeling system in his dissertation research, now focuses on regional forecast modeling in his work with Zhang at VIMS' Center for Coastal Resources Management (CCRM). Loftis leads the StormSense project, a research initiative to enhance emergency preparedness for coastal flooding utilizing SCHISM. StormSense has installed more than 40 ultrasonic water-level sensors throughout Tidewater Virginia.

"We are expanding the frontiers of science very rapidly because of the superior capabilities of this particular modeling system."

"We take data from the sensors and feed the information into our model, but we also use the sensors to validate the accuracy of our model after major storm surge events" Loftis says.

StormSense has garnered nine national awards thus far. Loftis also was an inaugural winner of a Dean and Director's Innovation Fund Award in 2019, which he is using to commercialize a video camera system capable of detecting water-level data in real time. "We plan to integrate the sensor into our StormSense sensor network," Loftis says.

SCHISM IN ACTION

When VIMS completed a recent pilot project on flooding hazards for NOAA using the SCHISM modeling system, the agency's personnel knew they were looking at something unique. "It really opened their eyes," says Joseph Zhang. "They are fully convinced that our model is truly different from other models."

As a result, NOAA has signed a long-term agreement with VIMS as part of its initiative to develop next-generation forecasting models. As Zhang explains, because of its holistic design, SCHISM not only is applicable to flooding and storm surge, it also addresses NOAA's co-mission of safe navigation with superior forecasting of water currents — providing great economic benefits to major U.S. ports. Private companies are employing SCHISM as well. Mike Sapnar '88, P '20, president & CEO of TransRe, has been a critical advisor to the program on industry relations. At the start of this year, Zhang became one of two external advisors to the Silicon Valley start-up One Concern, which consults on disaster forecasting and resilience. "We are really breaking new ground," Zhang says.

Taiwan is using the SCHISM modeling system to enhance forecasts for ocean flooding.

U.S. AND GLOBAL PARTNERS

The SCHISM modeling system has been adopted worldwide. Sponsors and collaborators include:

Government

NOAA National Ocean Service and National Tsunami Program; EPA Chesapeake Bay Program; California Department of Water Resources; Oregon Department of Geology & Mineral Industries; Texas Water Development Board; Virginia Department of Transportation; Virginia Port Authority.

Business

BGS IT&E, an engineering company in Germany working on urban flooding; Moffatt & Nichol; GRI, a geotechnical engineering company; PIVOT Architecture; MetOcean Solutions, a New Zealand consulting firm.

International Organizations

Joint European Research Centre, Italy; International Center for Advanced Studies on River–Delta–Sea Systems (DANUBIUS-RI); Laboratório Nacional de Engenharia Civil, Portugal; German Federal Institute of Hydrology; Helmholtz Association of German Research Centers; Second Institute of Oceanography, Hangzhou, China; Central Weather Bureau, Taiwan.

FELLOWSHIP SUPPORTS SEA-LEVEL RISE RESEARCH

A decade ago, Phyllis Cothran and her husband, Dr. Arnold Stolberg, bought a riverfront home in Gloucester. From that vantage point, the couple gained a close-up view of encroaching sea-level rise. Their desire to learn more resulted in a sustained partnership with VIMS. In fiscal years 2109-20, Cothran has served as president of the VIMS Foundation.

Wanting to make an impact for the future, the couple created the Phyllis L. Cothran and Arnold L. Stolberg Fellowship Endowment to provide support for graduate students studying sea-level rise — giving young scientists the opportunity to work with VIMS researchers like Joseph Zhang and Derek Loftis to develop new insights into global coastal change. "It is so stimulating to see that really smart, excited people are working on these very real problems that the world has to figure out," Cothran says.

ACTIONABLE SCIENCE

Today in Virginia's Hampton Roads region, water levels are a foot and a half higher than they were a century ago. They are expected to rise another 5 feet by the year 2100, while the land sinks as much as 7.5 inches.

VIMS is at the forefront of research on coastal resilience, deploying experts across a wide range of disciplines from wetland ecology to data and modeling to help communities adapt to sea-level rise. This consulting is delivered through VIMS' unique advisory service mission, which grounds the Commonwealth's marine policy decision-making in the best science. This connectivity positions VIMS and Virginia as global leaders in deploying science in partnership with communities, and makes Hampton Roads a cutting-edge testing ground for adaptation solutions.

"Thanks to our advisory service mission, VIMS translates science into solutions in Virginia, which uniquely positions us for national and global leadership on community planning for coastal resilience."

— MARK LUCKENBACH, ASSOCIATE DEAN OF RESEARCH AND ADVISORY SERVICES

'A ONE-STOP SHOP' FOR VIRGINIA

In 2016, the Virginia General Assembly formalized the ongoing collaboration among the state's top experts on coastal resilience, creating the Commonwealth Center for Recurrent Flooding Resilience. The Center's affiliated partners include:

VIMS, with the Center for Coastal Resources Management in the lead.

OLD DOMINION UNIVERSITY, including faculty in Economics, Engineering, Geography, and Ocean, Earth and Atmospheric Studies.

THE VIRGINIA COASTAL POLICY CENTER,
which integrates the expertise of VIMS and the W&M Law School and Public Policy Program to provide science-based legal and policy analysis on coastal resource issues.

The Center conducts interdisciplinary studies and provides scientific and technical support to government agencies, businesses, and private citizens. "It's a 'one-stop shop' for scientific, socioeconomic, legal, and policy analyses aimed at building Virginia's resiliency against flooding," says Mark Luckenbach.

COASTAL RESILIENCE TOOLBOX

Over the last five years, VIMS has introduced new and enhanced tools to help the public understand climate adaptation and reduce risk.

SEA LEVEL REPORT CARDS

In 2018, VIMS introduced new web-based "report cards" to monitor changes in sea level at 32 localities from Maine to Alaska, projected out to the year 2050. The reports offer a key advantage by using relative sea-level measurements — changes in water level relative to the land surface. Local rates of relative sea-level rise give a direct indication of the extent to which homes, buildings, and roads are at risk of flooding.

TIDEWATCH MAP ©

Tidewatch is a 36-hour tidal forecasting system originally developed by emeritus professor John Boon. Using SCHISM and other modeling systems, VIMS scientists have now introduced the Tidewatch Map, which provides coastal Virginia residents with visual representations of water levels in their own neighborhoods. "You literally can see whether or not particular roads are going to be flooded," says Mark Luckenbach.

ADAPTVA

Launched in 2017, AdaptVA provides a single point of access for comprehensive information about climate adaptation. Designed for a wide range of users, the web portal includes links to legal and policy resources, risk assessment tools, forecasts, diagrams of building modifications, and much more. The project development team was led by the Center for Coastal Resources Management.

SHORELINE STUDIES PROGRAM

The VIMS Shoreline Studies Program, directed by Scott Hardaway, provides information and recommendations to localities on shoreline erosion rates they map from historic imagery using cutting edge science. The program consults with landowners to advise on their shore stabilization needs.

3

ENHANCING THE ECONOMY

From our early success in hard clam aquaculture to our leadership in the oyster industry, VIMS science has spurred economic growth and job creation in coastal communities across the U.S.

Architectural rendering of the 22,000-square-foot Acuff Center for Aquaculture, funded with a $21.7 million investment from the Commonwealth.

Thinking Big

Acuff Center for Aquaculture honors Marshall Acuff's decades of leadership at VIMS

VIMS will soon break ground on the Acuff Center for Aquaculture — a state-of-the-art facility funded by the Commonwealth that positions Virginia to advance as a global economic leader in sustainable shellfish aquaculture. The facility honors the exceptional leadership and generosity of A. Marshall Acuff, Jr. '62, L.H.D. '07, P '93 on VIMS' behalf, and is named for the Acuff family.

The Acuff Center for Aquaculture will be the home for a new Shellfish Aquaculture Program that integrates VIMS' world-renowned, multidisciplinary aquaculture initiatives focusing on hard clams, oysters, and bay scallops, with the potential addition of soft-shell clams in the future. Thanks to VIMS, Virginia is currently No. 1 in the U.S. in hard clam production and No. 1 on the East Coast for production of the eastern oyster.

Overseeing the aquaculture program as director will be a new faculty member appointed to the A. Marshall Acuff, Jr. Professorship, a position endowed by Marshall Acuff in 1988. The director will coordinate all of the program's research, teaching, and advisory functions and guide the work at VIMS' aquaculture facilities — the newly renovated Eastern Shore Laboratory hatchery, the Kauffman Center for Aquaculture on the Rappahannock River, and the Aquaculture Genetics and Breeding Technology Center, to be housed within the Acuff Center for Aquaculture. In addition, the director will develop a graduate-level aquaculture curriculum to augment VIMS' existing aquaculture training program.

Former W&M rector and chair of the *For the Bold* campaign at VIMS, Marshall Acuff was honored this past fall as Homecoming grand marshal.

"The combination of this wonderful new facility and the distinguished professorship — it's really exciting to see," says Mark Luckenbach, VIMS associate dean of research and advisory services. "All of these resources coming together, with the Marshall Acuff Professor providing direction, will put VIMS at the absolute forefront in marine shellfish aquaculture."

"All of these resources coming together, with the Marshall Acuff Professor providing direction, will put VIMS at the absolute forefront in marine shellfish aquaculture."

From the early 1960s, when researcher Michael Castagna developed successful techniques to grow hard clams at the Eastern Shore Laboratory, VIMS has played a pioneering role in shellfish aquaculture. After the diseases Dermo and MSX decimated the Chesapeake Bay's oyster population, VIMS pathologists and geneticists led by Professor Stan Allen spearheaded the extraordinary revival of the industry by developing fast-growing, disease-resistant oyster strains. On the Eastern Shore, bay scallops may be the next comeback story (see page 25).

As an Eastern Shore native who harvested oysters alongside his father growing up, Marshall Acuff has been keenly aware of the economic benefits shellfish aquaculture brings to coastal Virginia. He became an early investor in VIMS' aquaculture program, establishing the A. Marshall Acuff, Sr. Memorial Oyster Research Fund in his father's honor. When the time came to sell his family's Eastern Shore farm, he could think of no better use for the funds than providing support for an integrated VIMS Shellfish Aquaculture Program. Over his lifetime, he has contributed more than $5 million to VIMS. In addition to his financial support, Acuff has provide decades of leadership service on the VIMS Foundation Board and VIMS Council, and as chair of the *For the Bold* fundraising campaign at VIMS.

"Aquaculture has brought jobs for a new generation,

often the sons and daughters of watermen," Acuff says. "And it's the type of jobs, involving 21st-century technology, that really makes a difference. That's the biggest motivation — what it does for coastal economies, not only here in Virginia, but nationwide."

With greatly expanded laboratory space, the Acuff Center for Aquaculture will provide new opportunities for innovative research across disciplines. "We have people in biological sciences who are instrumental now in studying how ocean acidification affects the growth of oysters, especially larval ones," says Mark Luckenbach. "World-class researchers like Ryan Carnegie in aquatic health sciences are studying emerging diseases. And people in the physical sciences are doing hydrodynamic modeling to estimate the carrying capacity for shellfish aquaculture operations in individual bodies of water."

"The challenges we face today require comprehensive multidisciplinary teams with very, very broad expertise," says Carnegie, whose research has been supported by the A. Marshall Acuff, Sr. Memorial Oyster Fund. Carnegie's recent findings show that oyster aquaculture can actually limit the spread of disease among wild oysters.

The changing climate presents additional stresses, he notes. "It's not just warming. It's changes in precipitation, it's distribution of marine pathogens, and harmful algal blooms.

"It's so important that we figure this out. The Acuff Center for Aquaculture gives us the ability to think big."

The new Acuff Center for Aquaculture will build on VIMS' decades-long leadership in shellfish aquaculture research.

Karen Hudson

SHELLFISH AQUACULTURE SPECIALIST

When Virginia's shellfish farmers need advice, they call Karen Hudson of VIMS' Marine Advisory Program — the marine counterpart to an agricultural extension agent. "I'm that first point of contact. If someone calls and says, 'I've lost a bunch of oysters,' I'll go out there and see for myself what's going on, and I'll get on the horn and wrangle the experts."

The industry trust VIMS has developed enables Hudson to do for Virginia what other states haven't — prepare an annual report based on surveys from farmers themselves. "It's voluntary, and I think it speaks volumes that we get a lot of response," she says. "It's been really helpful demonstrating the industry's growth. They can take this report to Richmond and DC, slap it down and say, 'This is what we're worth.'"

Hudson notes that industry will be critical in evaluating research breakthroughs developed at the new Acuff Center for Aquaculture, a win-win for VIMS and the shellfish farmers who will benefit. "This is a partnership, and we couldn't do it without them."

2019 HIGHLIGHTS VIRGINIA SHELLFISH AQUACULTURE SITUTATION AND OUTLOOK REPORT

- Farm gate value for Virginia shellfish aquaculture was $53.4 M
- Oysters are the most rapidly developing sector of Virginia's shellfish aquaculture
- Virginia is 1st in the U.S. for hard clam production
- 1 Virginia is 1st on the East Coast of the U.S. for eastern oyster production

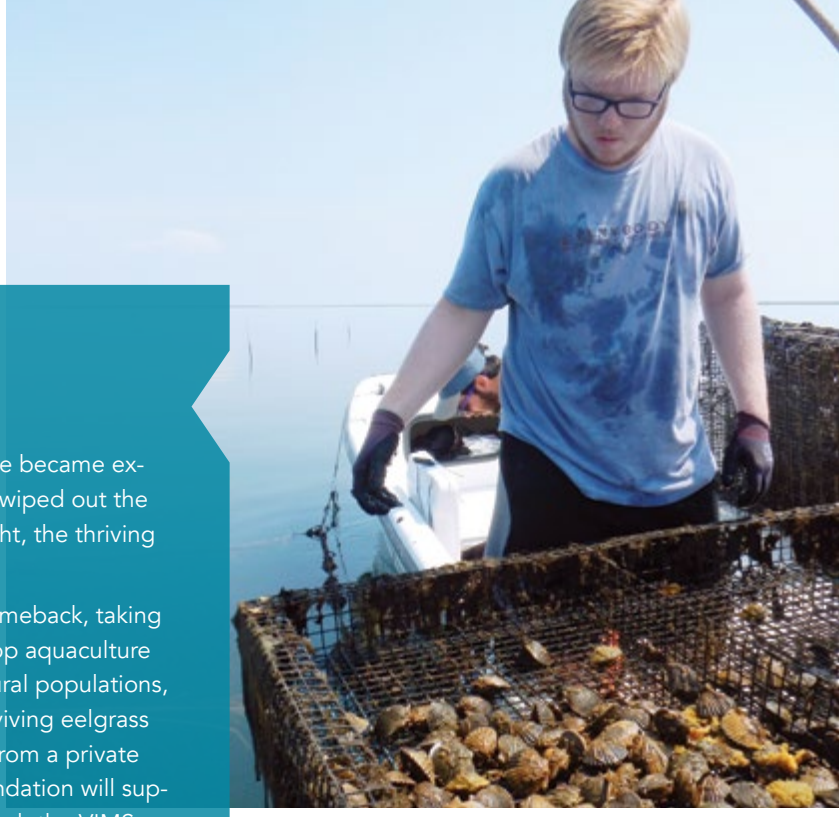
GO VIRGINIA

VIMS plays an active role in workforce development in the Commonwealth. As part of that role, VIMS is a key participant in GO Virginia, a bipartisan, business-led economic development initiative to create more and higher-paying jobs across the state. "We welcome this new opportunity to promote joint VIMS-industry projects," says VIMS Dean and Director John Wells, who serves on GO Virginia's Region 6 council, encompassing the Middle Peninsula and Northern Neck. "For the region's workforce, VIMS' research has generated aquaculture jobs that continue the tradition of working on the water in a modern way."

SCALLOP COMEBACK?

In the 1930s, bay scallops on Virginia's Eastern Shore became extinct when disease, dredge fishing, and a hurricane wiped out the eelgrass that made up their habitat. Almost overnight, the thriving commercial bay scallop fishery ceased to exist.

VIMS is spearheading the effort for a bay scallop comeback, taking a two-pronged approach — experimental bay scallop aquaculture at the Eastern Shore Lab and the restoration of natural populations, made possible by VIMS' unprecedented success reviving eelgrass beds in coastal bays. A new five-year commitment from a private family fund at the Hampton Roads Community Foundation will support this important work, which is coordinated through the VIMS Shellfish Aquaculture Program.



More than 200 donors contributed to Save Our Bay Scallops, VIMS' inaugural crowdfunding campaign, in support of bay scallop restoration.

A GOOD CATCH

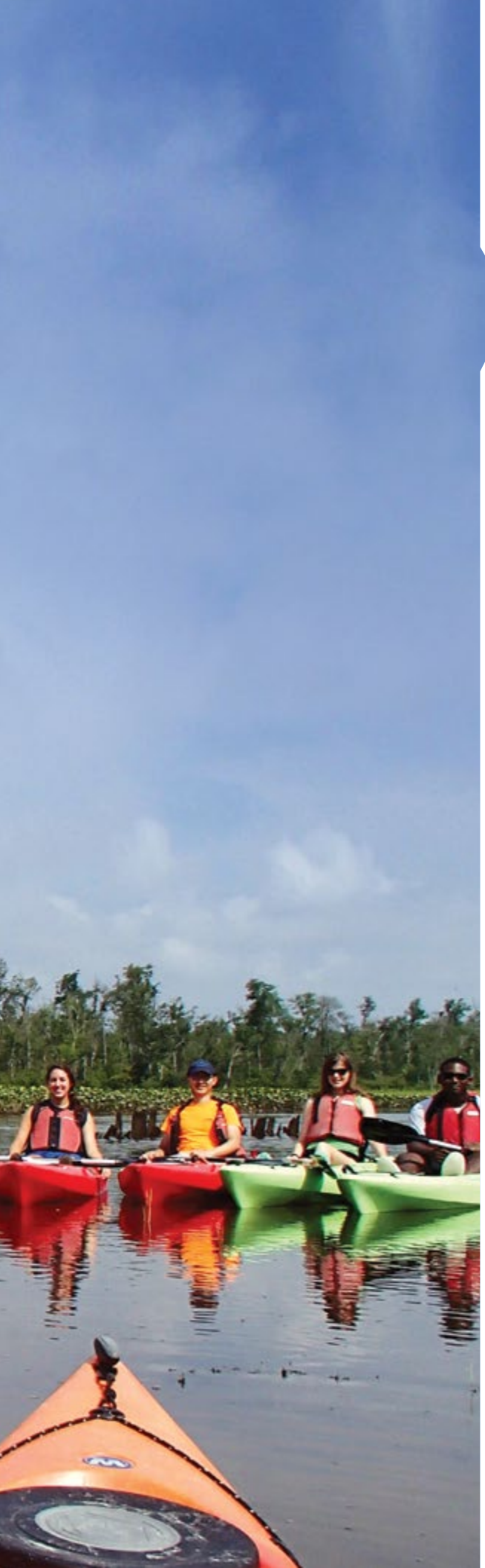
For decades, policymakers worldwide have relied on VIMS' expertise in fisheries management to ensure the continued economic health of the global fishing industry. Graduate students work side-by-side with faculty, gaining invaluable real-world experience. The International Council for the Exploration of the Sea (ICES) recently adopted methods developed by VIMS students — using mathematical models and statistical techniques — to assess fish stocks where limited data is available. Students mentored by Professor John Hoenig traveled to ICES headquarters in Copenhagen, presenting reviews on North Sea dab and the Norway lobster, among other species. "VIMS students are participating as full members of stock-assessment meetings, and serving as external experts both in North America and in Europe," Hoenig says. "It's remarkable."

Virginia reports more than $500 million in recreational fishing–related sales annually.

4

EDUCATING MARINE LEADERS

Exceptionally bright. Impassioned. Our students are among the world's best and they leave here ready to solve global problems.



A Capital Experience

Selected for the prestigious Knauss Fellowship, VIMS students turn policymakers

In February, James DelBene M.S. '19 traded his lab bench for a desk on Capitol Hill — beginning a yearlong Knauss Marine Policy Fellowship working for Senator Lisa Murkowski of Alaska.

The Knauss Fellowship, established in 1979 and administered by NOAA's Sea Grant program, offers young marine scientists like DelBene an immersive policymaking experience, placing them in legislative and executive positions in Washington, D.C. Since the program's inception, VIMS has been a top institution nationally in placing students and recent graduates as Knauss Fellows.

"Science has a critical role in informing policy," says Troy Hartley, director of Virginia Sea Grant. "It's more than just doing amazing science — it's understanding what policymakers need and the nature of the problem they're trying to solve. You just can't get that unless you step into their shoes. That's the huge advantage of Knauss."

Linsdey Kraatz Ph.D. '13, who worked as an advisor to Rep. Mike Thompson of California, vividly remembers the steep learning curve she encountered when she arrived in Congress as a Knauss Fellow.

"In my first week as a fellow, I was in a meeting with constituents, and the Congressman turned around and said to me, 'Lindsey, write me a bill.'" She jotted down "Write

Students participating in the VIMS Research Opportunities for Undergraduates program explore the waters of the Eastern Shore.

Bill?" on her notepad, the first step in her eventual mastery of the lawmaking process.

"I got bit by the bug," says Kraatz, now at NOAA, who initially planned on an academic career. "It opened my eyes to other possibilities I didn't know existed."

"The Congressman turned around and said, 'Lindsey, write me a bill.'"

As an advisor to Massachusetts Senator Ed Markey, Knauss Fellow William Goldsmith Ph.D. '18 drew directly on his VIMS experience working with recreational tuna fishermen. He worked to ensure that the Modernizing Recreational Fisheries Act of 2018 did not undermine sustainable fisheries management practices, and also engaged stakeholders in crafting a bill to help endangered right whales.

"One of the major contributors to right whale mortality is entanglement in fishing gear," says Goldsmith, now executive director of American Saltwater Guides Association. "So we were trying to find a way to address conservation while not putting undue pressure on our lobstermen, which is a tricky needle to thread," he says, "It's emblematic of what legislators do."

Goldsmith and Kraatz, along with scores of other VIMS graduates, are now part of an exceptional network of Knauss alumni — with James DelBene soon joining them. "These are people who end up moving into powerful policy positions down the road," Troy Hartley says. "They're leaders in their field."

During his Knauss Fellowship year, William Goldsmith Ph.D. '18 worked in the office of Senator Ed Markey.

Matthew J. Strickler M.S., M.P.P. '07

VIRGINIA SECRETARY OF NATURAL RESOURCES

After graduating from college, Matthew J. Strickler set out on a career as an environmental policymaker. "But I knew I needed to have a first-hand understanding of the scientific process and how to think like a scientist," he says. Strickler enrolled in the joint marine science/public policy program offered through VIMS and William & Mary's Thomas Jefferson Program in Public Policy. His research focused on using geographic information system (GIS) modeling to study the impact of Eastern Shore land use changes on water quality.

Strickler also served as a Knauss Fellow on Capitol Hill, which eventually led to his position as senior policy advisor to the House Committee on Natural Resources. In January 2018, Governor Ralph Northam appointed him to his current position as Virginia Secretary of Natural Resources.

While at VIMS, Strickler built connections with scientists, regulators, and the aquaculture industry that he still relies on today. "The Governor's Executive Order 24 on coastal adaptation and resilience — a lot of that was born out of conversations that my advisor Carl Hershner and I had. VIMS' science is seen as the gold standard by the public, and by members of the General Assembly on both sides of the aisle."

Associate Dean Linda Schaffner Ph.D. '87 has spearheaded VIMS' innovative education programs, winning state and national accolades as an educator. VIMS has one of the largest marine science graduate programs in the U.S., with more than 1,000 alumni.

"Our goal at VIMS is to shape our students to provide leadership at the interface between what scientists can do and what society and policymakers need."

NEW M.A. IN MARINE SCIENCE

VIMS has introduced a new degree program, the M.A. in Marine Science, designed for students pursuing careers that bridge marine science and other professional areas.

"There's a pool of students who want to pull from the science side as well as the policy or law or education side to address problems that require the integration of information from diverse fields — what sociologists call 'wicked' problems," says Associate Dean of Academic Studies Linda Schaffner Ph.D. '87, who led the program's development.

The curriculum is deliberately designed to be flexible. "Students will get the same world-class marine science education as M.S. students do. The change comes when they transition to elective courses, culminating in an internship and capstone project," says John Griffin, M.Ed. '19, assistant director for admissions and student affairs. Schaffner adds: "Our ability to partner with the other strong programs at William & Mary will give our graduates an extra boost when it comes to employment opportunities."

For more information, please contact John Griffin at jmgriffin@vims.edu.

STEMMING THE TIDE OF PLASTICS POLLUTION

Meredith Seeley first became interested in plastics as a master's degree student at the University of Texas. "I used a technique to study oil spills that is also used in plastics research, and so I dove into the literature on microplastics." She learned of Professor Rob Hale's work at VIMS, applied and was accepted to the doctoral program.

More exciting still, Seeley was awarded the Freeman Family Fellowship in Marine Plastic Pollution, funded by the Freeman Family Foundation — the first-ever fully privately funded graduate student fellowship at VIMS. In her research, Seeley has followed the impact of plastics on marine life ranging from microbes to larger species like rainbow trout in the Pacific Northwest. Just this year, she was first author on an article for *Nature Communications* on how microplastics affect sedimental microbial communities and the nitrogen cycle.

And along the way, she's become close with Peg Freeman and her children, who were instrumental in the fellowship's creation. "Peg Freeman is the pioneer in this, and someone really wonderful to look toward for inspiration. It's a unique situation, and I'm so fortunate."

Meredith Seeley spoke at VIMS' popular After Hours lecture series on her research in Alaska, collecting water and sediment samples to study chemicals leaching from marine plastics.

"Peg Freeman is the pioneer in this, and someone really wonderful to look toward for inspiration."

ATTRACTING EXCEPTIONAL TALENT

Private support enables VIMS to recruit the highest caliber students and enhance our global prominence. During the *For the Bold* campaign, generous supporters committed to endow 22 new graduate fellowships.

- R. Gordon and Catherine B. Smith Fellowship Endowment
- Tidewater Oyster Gardeners Association (TOGA) Fellowship
- Norfolk Southern Foundation Fellowship Endowment
- James E. & Anne McCracken Rogers Graduate Student Fellowship Endowment
- Olsson Family Graduate Student Fellowship Endowment
- Rebecca M. Dickhut Endowment for Support of Students and Early Career Young Scientists
- Mary Hedrick Causey Memorial Fellowship Endowment, established by J.P. Causey, Jr.
- Nancy S. and Henry H. George Fellowship Endowment
- Strickland Family Fellowship Endowment
- Bruce K. Goodwin Fellowship Endowment, established by William Jerrold Samford and Ann Markel Samford
- Dr. Maynard Nichols and E. Jane Nichols Student Travel Fellowship Endowment
- Philip A. and Barbara C. Wenger Graduate Fellowship Endowment
- MacWhorter Family Fellowship Endowment
- Brenton S. Halsey Fellowship Endowment
- Waleski-Smith Fellowship Endowment
- George Edwin and Amelia Ann Dick Fellowship Endowment
- Phyllis L. Cothran & Arnold L. Stolberg Fellowship Endowment
- Robert and Jennifer Latour Fellowship Endowment
- John and Patsy Wells Fellowship Endowment
- Ronald West Family Foundation Military & Veterans Fellowship Endowment
- Cake Family Fellowship Endowment
- The Sara E. and Bruce B. Collette Fellowship Endowment

At top, Professor Chris Hein and his students work on the Eastern Shore aboard the *Peregrination*, a vessel purchase supported through giving from VIMS Foundation president emeritus Stephen Johnsen HON '18 and Barbara Johnsen Ed.S. '90, Ed.D. '95.

5

EMPOWERING OUR PEOPLE

In the last five years, we have made significant investments to enhance the working environment for VIMS' most vital resource — our people.

A New Flagship

The R/V *Virginia* opens new horizons in marine research

On a blustery day in April 2019, VIMS celebrated the christening of its new flagship R/V *Virginia*, built with a $10 million investment from the Commonwealth of Virginia. Flanked by VIMS Dean and Director John Wells and W&M Rector John Littel, the Commonwealth's First Lady Pam Northam broke the traditional bottle of champagne over the ship's gunwale — ushering in a new era for VIMS research, education, and advisory services. "No other vessel in its size class provides the deck gear, the geophysical capabilities, and the coring capabilities of the *Virginia*," Wells says. "It's got the flexibility to do almost anything on the water that our scientists might want to do, now or in the future."

At 93 feet in length, with a 28-foot beam and 11-foot draft, the Virginia can adeptly navigate both offshore waters and the shallow reaches of the Chesapeake Bay. "The *Virginia* provides a much improved platform for our fisheries surveys, which are the foundation for recreational and commercial fisheries management not only in bay waters but for species up and down the East Coast," says Associate Dean of Research and Advisory Services Mark Luckenbach.

Professor Rob Latour spent many weeks last summer and late into the fall on the *Virginia* conducting multispecies fisheries surveys as well as VIMS' renowned shark survey. "The advantages it provides — from enabling us to haul an 8,000-pound load to expanding our footprint out to 1,500 nautical miles — are already having a huge impact on our work."

With greatly expanded haul capacity and deckspace, VIMS' new flagship provides enormous benefits for fisheries surveys.

R/V VIRGINIA SPECS

130-foot Wet Lab
270-foot Dry Lab

Total Berths: 12

Endurance: 10 days
Cruising Speed: 10 knots

Range: 1,500 nautical miles

Stern- and side-mounted cranes for deployment of trawl nets and dredges, scientific buoys and new-generation robotic vehicles

"The boat in its dynamic positioning mode will hold station within half a foot in unbelievable conditions, with 20-25 knot winds. Think of the dividends if you're coring or deploying navigational equipment. It's just amazing."

Captain John Olney

John Olney, Jr. first began working in Vessel Operations at VIMS as a 16-year-old, painting bottoms and fueling boats. Today, Olney commands a far different view of the VIMS fleet — at the helm of the R/V *Virginia*.

As captain, he is especially impressed with the ship's advanced engineering. "We put in a dual propulsion system, where one motor can drive the propulsion while the other drives the hydraulics — operating the large winches we use to pull in ocean trawl," he says. "To my knowledge, there is not another research vessel in the U.S. designed this way. It allows for a lot of flexibility."

Olney is a second-generation VIMSer, the son of the late Professor John Olney, Sr. "I'm biased of course, but I always thought of my dad as a unique researcher. He had the rare ability to geek out with colleagues about the evolution of a shad's rib cage, then turn around and argue with the local farmer about pulling suckers off a corn plant," he says. "I just wish he'd had the chance to make a trip on the *Virginia*."

CHALLENGE MET

Last fall, VIMS kicked off a campaign to raise funds to purchase a $1 million sonar suite for the R/V *Virginia* and match a $400,000 challenge grant awarded by the Mary Morton Parsons Foundation. The state-of-the-art sonar suite includes a multibeam that creates highly detailed seafloor maps and an echosounder that enables collection of data on marine life anywhere in the water column.

Jeanette McKittrick, VIMS Foundation vice president, made the official campaign kick-off announcement at an evening event in Richmond. The event was held at NewMarket Corporation headquarters, courtesy of council member emeritus and NewMarket CEO Teddy Gotwald. As part of the campaign, the *Virginia* also traveled to Richmond and Alexandria for dockside tours. The vessel's campaign visit to Norfolk was sacrificed due to COVID-19, but we hope to get her there eventually for tours. Thanks to the generosity of hundreds of supporters, including those who gave through W&M's Tribefunding platform, VIMS successfully met the Mary Morton Parsons Foundation challenge.

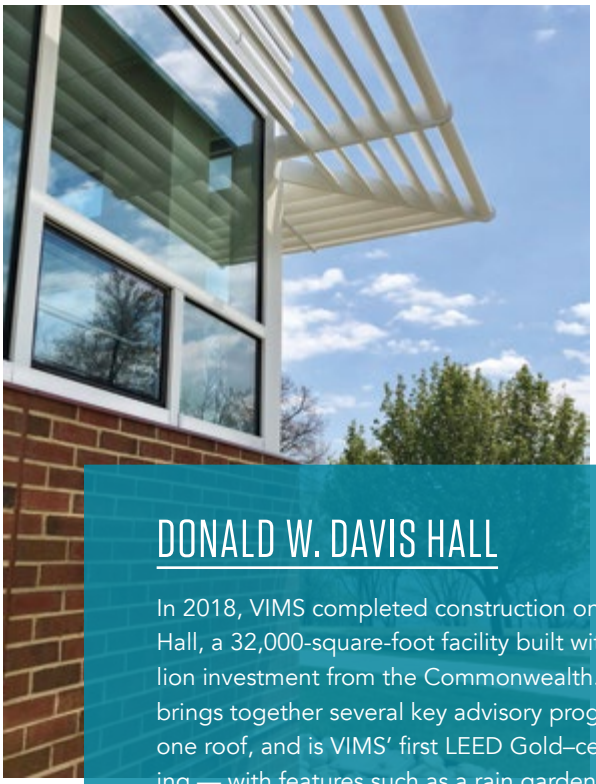
Newly named spaces aboard the vessel will be announced in an upcoming *Impact* newsletter.

BUILDING COMMUNITY

NEW INITIATIVES ENHANCE CAMPUS LIFE

EASTERN SHORE LAB

VIMS' ESL is embarking on a $17 million campus expansion with six new buildings and a renovated shellfish hatchery. Facilities are purpose-built to protect against sea-level rise.



DONALD W. DAVIS HALL

In 2018, VIMS completed construction on Davis Hall, a 32,000-square-foot facility built with a $14 million investment from the Commonwealth. The building brings together several key advisory programs under one roof, and is VIMS' first LEED Gold–certified building — with features such as a rain garden and solar shading for energy efficiency.

FACILITIES MANAGEMENT BUILDING

The dedication plaque on the new Facilities Management Building pays tribute to the staff's indispensable role in supporting VIMS' mission. "I wanted it to reflect them, as opposed to the building," says Chief Operations Officer Joe Martinez. "I like to call all of our operations members the heartbeat of the community." The much-needed new building opened last fall, and has been especially appreciated as staff members respond to COVID-19. "Where others have been able to work from home, they've been coming to work," Martinez says. "They've been real troopers. I'm really, really proud of them."

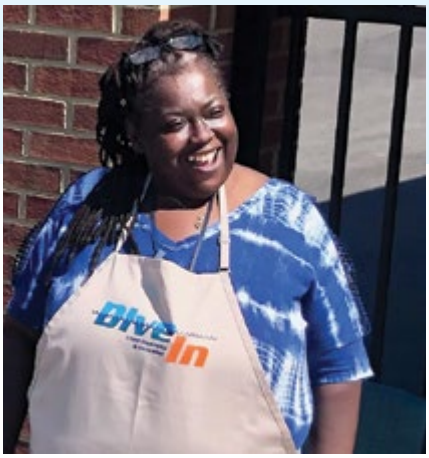
The new $7.5 million Facilities Management Building provides 15,000 square feet of space.

HEALTHY MINDS

Graduate school puts considerable stress on students, ranging from academic pressure to job market concerns. "There's been growing public acknowledgment that grad students are dealing with increased depression and anxiety," says Linda Schaffner, associate dean for academic studies, who began developing plans several years ago to supplement William & Mary's mental health services by having a counselor on the VIMS campus. Longtime supporter Althea MacWhorter provided essential funding to bring these plans to fruition. "It's been absolutely essential," Schaffner says. "When we do our surveys, students highlight how important it is to have these services on campus."

PURSUING EQUITY

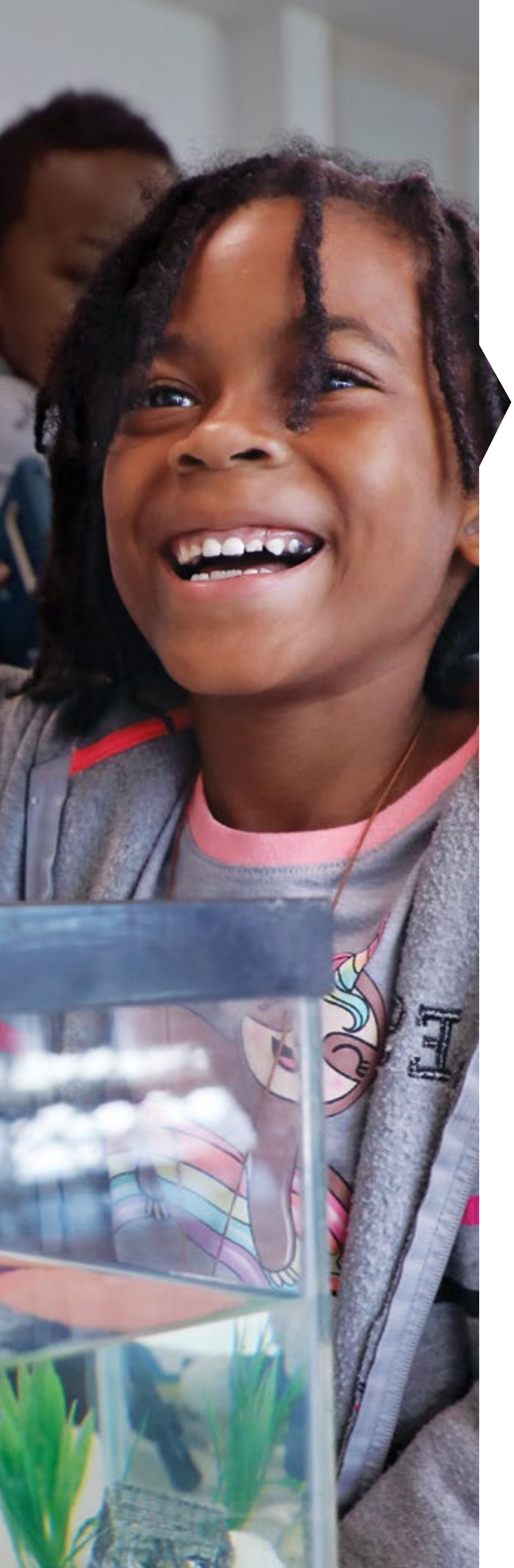
From pop-up socials to panel discussions and more, VIMS' Diversity and Inclusion Committee — better known as Dive-In — has made a big impact on campus. "One focus of Dive-In that best encompasses our work has been Lunch-N-Learn events," says Research Professor Rochelle Seitz, committee chair. "One of our earliest lunches, which had full enrollment, was on supporting LGBTQ+ students and employees. From this, our committee developed a list of barriers and potential solutions." Other lunch topics have included understanding unconscious bias and welcoming the international community. "Through these discussions, we've really come to appreciate what each individual contributes to VIMS' success."



6

BROADENING OUR IMPACT

VIMS is creating innovative ways to enhance public understanding of our mission, forming partnerships and reaching new audiences.



VIMS Ventures

Innovation Fund supports entrepreneurs-in-the-making

A disease-resistant oyster. Biodegradable crab pot panels. An underwater robot to measure oil slicks. These are just a few of the innovative products created by people at VIMS — with significant environmental and economic benefits.

What if more of this potential could be unleashed?

That's the impetus behind VIMS' new Dean and Director's Innovation Fund, championed by longtime supporter E. Morgan Massey and established with generous start-up funding from the Joan & Morgan Massey Foundation and the Nunnally Charitable Trust.

"In my professional career, one of the things I've learned acutely is that organizations that aren't innovating and don't have a culture around innovation can't compete and can't stay relevant," says VIMS Foundation board member Anne Waleski '89, former CFO and executive vice president of Markel Corporation.

"VIMS has always been innovative, but I think doing this in a deliberate way is really important. I'm thrilled that Morgan had the foresight to set it up," says Waleski, who chairs the fund's working group. "I went into the first meeting hopeful, and came out pretty blown away," she adds.

Like VIMS' own version of "Shark Tank," the Innovation Fund provides financial backing, business coaching, and technical assistance to help faculty and student entrepreneurs develop great ideas in marine science that are commercially viable.

"VIMS is a natural for applied innovation. It's innate," says working group member Rob Quartel, chair and CEO of NTLEX, explaining that VIMS' tripartite mission

VIMS Foundation board member Anne Waleski '89 chairs the working group for the Innovation Fund, an initiative spearheaded by VIMS Foundation co-founder Morgan Massey.

gives it an advantage over purely academic institutions. "The most obvious example is what faculty have done on oysters — they virtually singlehandedly saved that industry."

Over the past year, Quartel has generously provided pro bono technical advice to inaugural co-winner Lisa Kellogg, helping her leverage her initial $6,000 award to secure a significant external grant. Kellogg became a repeat winner this year, along with her colleague Professsor Eric Hilton, curator of VIMS' Nunnally Ichthyology Collection (see story below).

Researcher Derek Loftis Ph.D. '14 received the other inaugural award for his pitch to commercialize a water-level sensor, developed as part of VIMS' nationally recognized StormSense flood-monitoring initiative.

"I went into the first meeting hopeful, and came out pretty blown away," Waleski says.

"I think the Innovation Fund is a real opportunity for VIMS to shift its profile," Waleski says. "Today, it's not table stakes, but it will be at some point in the future. If you're out on the curve, and develop it as a core competency, it can become a real differentiator."

Dr. Lisa Kellogg

2019 & 2020 AWARD WINNER

When VIMS research scientist Lisa Kellogg wanted to find a better sampling method to study fish in the Chesapeake Bay's restored oysters reefs, an idea sprang to mind. "I already knew of the success of the Cornell Ornithology Lab with their Merlin Bird ID and eBird apps," she says. "I realized we could use a similar approach, turning recreational anglers into community scientists." She submitted her proposal for a fish app in the first Innovation Fund competition and won.

In addition to photos captured in the field, Kellogg is drawing on the resources of VIMS' renowned Nunnally Ichthyology Collection, with more than 500,000 fish specimens. "Lisa invited me on as a co-principal investigator for this round," says the collection's curator, Professor Eric Hilton. "My role is the verification of photos being used to train the app's artificial intelligence." In May, the two colleagues shared a 2020 Innovation Fund Award.

Kellogg has received invaluable technical assistance from working group member Rob Quartel, whose donation of time helped her meet the matching requirement for a major National Fish and Wildlife Federation grant. "Trying to meld the worlds of recreational fishermen, biologists, and software engineers — it's been an adventure," she says.

Kersey Sturdivant is a co-founder and principal scientist for INSPIRE Environmental, which uses Sediment Profile Imaging technology to assess seafloor health.

Kersey Sturdivant Ph.D. '11

CO-FOUNDER, INSPIRE ENVIRONMENTAL

As an inventor, entrepreneur, and VIMS alumnus, Kersey Sturdivant is a natural fit for the Innovation Fund Working Group. "From the initial meeting, I was impressed at the energy and motivation and ideas that were swirling around the table."

Sturdivant's career as an inventor began at VIMS, where he designed "WormCam" using Sediment Profiling Imaging technology. Today, he continues to deploy that technology as principal scientist at INSPIRE Environmental, a company he co-founded, which analyzes seafloor health for a range of clients. He's also an adjunct professor at Duke.

Sturdivant continues to develop innovative devices — creating low-cost marine hardware through Open Oceanography, a venture he founded with a Duke colleague. They began with the CTD, which measures conductivity, temperature, and depth in seawater and can cost up to $15,000. "We crowd-funded money for the startup, developing a $300 CTD that people can build using commonly available parts," he says.

He believes the Innovation Fund holds great promise. "I think it provides the opportunity to potentially attract a different kind of student, like someone interested in environmental entrepreneurship," he says. "It's a no-brainer that VIMS should have something like this, given the level of research here."

INNOVATION FUND WORKING GROUP

Anne Waleski '89, Chair
Former Executive VP and CFO, Markel Corporation

Michela English
Strategic Corporate and Nonprofit Advisor; Former Executive, Discovery Communications, National Geographic

Caren Merrick
Co-founder, WebMethods;
CEO, Virginia Ready Initiative

Rob Quartel
Chair and CEO, NTLEX

Kersey Sturdivant Ph.D. '11
Principal Scientist, INSPIRE Environmental

Episode 7 of the "Deeper Dive" video series features Ike Irby Ph.D., M.P.P. '17, policy advisor to Senator Kamala Harris (D-CA). Other Deeper Dive episodes include "Saving the Shoreline" and "Studying Sharks."

TAKING A DEEPER DIVE

NEW VIDEO SERIES PUTS THE FOCUS ON VIMS SCIENCE

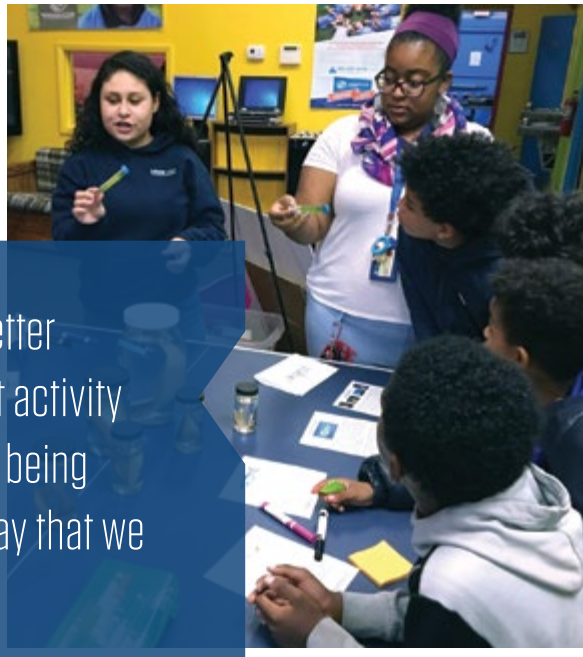
Click on VIMS' website or tune into YouTube, and you can get an up-close-and-personal view of cutting-edge marine science in the new video series, "A Deeper Dive." Made possible through a generous gift from Jim Rogers and Anne "Bootsie" McCracken Rogers, the series takes viewers behind the scenes to learn about subjects as diverse as cytobots and plastics pollution. "Our goal is to have good science communicated in a way that results in good policy," Jim Rogers says. "I want to make sure politicians realize that there's an institution in Gloucester, Virginia, that's got a huge amount of capability, and that they should rely on that science to implement good regulatory policy. The videos are also a great way to get people interested enough to ask questions and learn more about VIMS."

EXTENDING OUR REACH

VIMS freely shares its knowledge of marine and coastal science with members of the public through diverse educational outreach programs. These programs provide direct access to our scientists and translate the research conducted at VIMS into forms accessible by students, teachers, families, community groups, and decision-makers. Through public lectures, summer camps, family-friendly Discovery Labs, and teacher and technical trainings, VIMS outreach programs empower individuals around the world to make informed decisions, protect the marine environment, and impact their coastal communities.

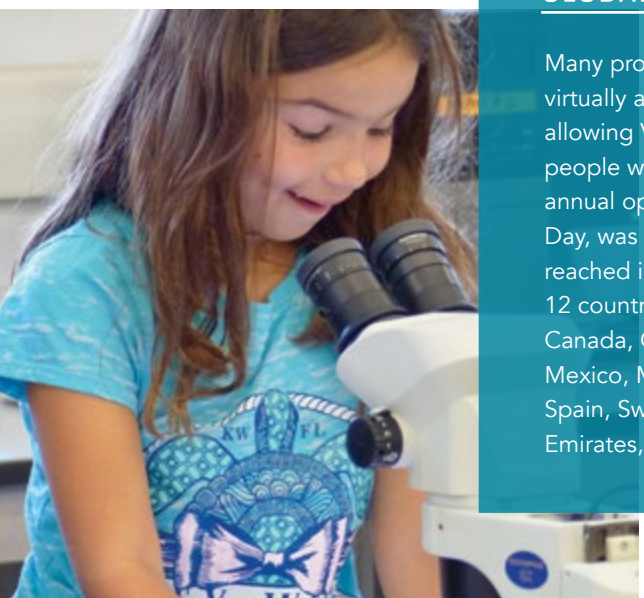
128,370

NUMBER OF PEOPLE REACHED WITH EDUCATIONAL OUTREACH PROGRAMS JAN 2015-JUNE 2020



"Our partnership with VIMS gives our kids bigger and better opportunities to learn about science. From the very first activity learning about different fish to visiting the campus and being able to get in the water, it was all very exciting. I must say that we have a couple future scientists on our hands!"

— JOSH GOFFIGAN, BOYS & GIRLS CLUBS OF THE VIRGINIA PENINSULA, SPEAKING ABOUT A VIMS AFTERSCHOOL PROGRAM FUNDED BY THE ARCONIC FOUNDATION



GLOBAL REACH

Many programs are delivered virtually as well as in-person, allowing VIMS to connect with people worldwide. In 2020, VIMS' annual open house, Marine Science Day, was conducted virtually and reached individuals in 41 states and 12 countries, including Australia, Canada, Germany, India, Ireland, Mexico, Montenegro, Portugal, Spain, Switzerland, the United Arab Emirates, and the United Kingdom.

16,220

NUMBER OF HOURS VIMS FACULTY, STAFF, AND STUDENTS SPENT INTERACTING FACE-TO-FACE WITH PUBLIC AUDIENCES JAN 2015-JUNE 2020

1,682

NUMBER OF PROGRAMS CONDUCTED JAN 2015-JUNE 2020

NETTING UNRESTRICTED FUNDS FOR VIMS

One Tribe One Day, William & Mary's annual day of giving, has sparked a tradition of fun and friendly rivalry at VIMS. Departmental teams, often dressed in marine-themed costumes, compete to achieve the highest rate of giving back to VIMS. In 2018, the VIMS Foundation Board added a $10,000 challenge, heightening the competition. "The Delicious Fishes" — led by staff team captains Celia Cackowski, Abigail Hils, Carol Tomlinson, and Adrienne Washington — netted the big win with an 85 percent participation rate from their team. The strong showing from all VIMS departments and donors helped secure a $15,000 university-wide Gerdelman Prize for VIMS for the highest percent increase in giving on One Tribe One Day. In recognition of their efforts, the four women were awarded the inaugural Massey Medallion, named for the Massey Foundation's long-term commitment to unrestricted giving at VIMS. "VIMS is a family," Cackowski said. "It's a group of dedicated people working together to accomplish incredible results, and I want to see its work continue."

The team of Celia Cackowski, Abigail Hils, Carol Tomlinson, and Adrienne Washington received the inaugural Massey Medallion for their One Tribe One Day success.

A SHELL SEEKER'S BEQUEST

Ask lifelong beachcomber Amelia Ann "Amy" Dick about shells and she can tell you just about anything — from the features of the oldest fossils to the habits of today's mollusk inhabitants. She's turned her passion into an enduring legacy as a nationally recognized amateur conchologist, winning awards for her scientific presentations. That same passion led Dick to establish a bequest to the VIMS Foundation to ensure the future health of our marine ecosystems. "To smell the ocean air brings me joy," she says. "Water is alive." She specifically earmarked her planned gift to help students studying water quality, so that "this love of mine will continue on after I'm gone. That is my legacy."

Steering a New Course

Leadership groups unite to form new VIMS Foundation

In 2016, following robust discussion and debate, the original VIMS Foundation Board (est. 2000) and the VIMS Council (est. 1982) voted unanimously to merge and combine their missions to form a new VIMS Foundation Board with a mission to advise and assist VIMS, promote philanthropy, steward the philanthropic resources of the VIMS Foundation, and act as ally and ambassador to position VIMS as the preeminent leader in coastal and estuarine science and education for Virginia and the world.

After his work with A. Travis Massey and John Wells to plan out the foundation's purpose and structure, integrate the missions of each body, and navigate the merger logistics, Stephen A. Johnsen was elected president of the newly reconstituted foundation and set it on the successful course it is pursuing today. VIMS and the VIMS Foundation are grateful to the many outstanding leaders who have served on the Council and the Foundation Board over the course of this campaign, listed on the following pages.

Stephen Johnsen HON '18 oversaw the merger of the original VIMS Foundation and VIMS Council to form a new VIMS Foundation, serving as the new board's first president. As a longtime supporter of the Eastern Shore Lab, he advised Dean & Director John Wells on securing funding to enhance its facilities and led an initiative to establish the Bonnie Sue Fund, a fund for Eastern Shore students to pursue internships at the ESL, named for Captain Robert Turner's boat the *Bonnie Sue*.

IN APPRECIATION OF VIMS FOUNDATION AND VIMS COUNCIL MEMBERS

FOR THEIR SERVICE DURING THE *FOR THE BOLD* CAMPAIGN

L. D. Amory III
Elizabeth Anderson, Ph.D. '62
Dan M. Bacot, Jr.
Cynthia Vaughan Bailey '77
Andrew Cameron Blandford '62
Glenda C. Booth
David C. Bosworth
Mrs. Sara Miller Boyd '54
Arthur H. Bryant II
The Honorable Morris Busby
John Paul Causey, Jr.
James A. Carleton
Guy Chapman
Phyllis L. Cothran
Clifford Cutchins IV
Emily Landon Davies '76
S. Wallace Dawson, Jr.
Teresa DiMarco
Adrian "Casey" G. DuPlantier, Jr.
Scott A. Edmonds
Michela English
Pamela F. Faggert
William Andrew Galanko, Esq. J.D. '83
Garland Waddy Garrett
Meril Gerstenmaier
Henry Harman George '65
Thomas E. Gottwald
C. Christian Hall III
Conrad Mercer Hall
Richard J. Hill '84
James Andrew Hixon, Esq. J.D. '79, M.L.T. '80
The Honorable Edward M. Holland
Henry R. Hortenstine III
The Honorable A. Linwood Holton LL.D. '72
W. Robert Jebson, Jr.
Stephen A. Johnsen HON '18
Wayne K. Johnson, Jr. '68
James A. Jones III, Esq.
Roberta Kellam
Lucius James Kellam III
R. Peter Lalor
Dennis H. Liberson '78
Gary K. Madson
The Honorable John O. Marsh, Jr.
A. Travis Massey






E. Morgan Massey
Jeanette McKittrick
David Nelson Meeker
Douglas Monroe, Jr.
The Honorable Harvey B. Morgan
Arthur W. Moye, Jr.
Charles Joseph Natale, Jr. M.A. '82
Dr. John R. Nelson, Jr.
S. Marshall Orr
Carroll Wallace Owens III M.B.A. '92
Carroll Wallace Owens Jr. '62
William A. Pruitt
James E. Rogers
Robert P. Roper, Jr.
Ann M. Samford '77
R. Gordon Smith
C. Vernon Spratley III '77
Gen. Carl A. Strock
William J. Strickland, Esq.
Ann Katherine Sullivan, Esq. '75
Randal C. Teague
H. Stetson Tinkham
Anne Waleski '89
Charles B. Walker
Guilford D. Ware
Ronald Lee West '73
Anne Marie Whittemore
F. Case Whittemore
Benjamin A. Williams III
A. Thomas Young

"The successful merger of the VIMS Council and the VIMS Foundation has realized our goal of achieving a laser focus on philanthropy. The active participation of members of both groups has helped significantly as VIMS steers a steady course in meeting its mission goals. A special thanks to all involved!"

— STEPHEN JOHNSEN HON '18,
VIMS FOUNDATION PRESIDENT EMERITUS

A New Chapter

VIMS celebrates seven faculty members who have gone on to new chapters in their lives over the past five years. Their careers were instrumental in building VIMS into a globally renowned institution.

DEBORAH BRONK

PRESIDENT & CEO OF BIGELOW LABORATORY FOR OCEAN SCIENCES

Prior to assuming her current position, Debbie served as the Moses D. Nunnally Distinguished Professor of Marine Science at VIMS, winning the Commonwealth's Outstanding Faculty Award in 2018. Her research focuses on ways that nitrogen controls the growth of microscopic organisms at the base of the marine food web. She has named VIMS as a beneficiary in her estate plans. "I'm happy knowing I will be helping the next generation of students build a life in science."

JOHN BRUBAKER

EMERITUS 2015

John's area of expertise is physical oceanography, in particular the dynamics of circulation in estuaries and on the continental shelf and the transport of marine life such as plankton through the water. A winner of the VIMS Outstanding Faculty Teaching Award, he helped colleague John Boon to develop the TideWatch modeling system to gauge coastal flooding in Virginia.

JEROME MAA

EMERITUS 2016

Jerome's interests are focused on two primary areas. His modeling studies of water wave mechanics have helped to address issues such as shoreline resiliency and harbor planning. His research on contaminant and sediment transport, including in the York River system, led him to develop the VIMS Sea Carousel field instrument. He served as host of the International Conference on Cohesive Sediment Transport held at VIMS.

JAMES PERRY

EMERITUS 2017

A lifetime member and former president of the Society of Wetland Scientists (SWS), Jim has focused his research on monitoring stress and documenting long-term changes in vegetation in tidal and non-tidal wetlands. He has been recognized for his efforts to promote the development of wetland science in Asia, where rapid economic growth has placed unprecedented stresses on wetland habitats, and honored with the SWS Presidential Service Award.

MICHAEL NEWMAN

EMERITUS 2018

Mike is an international scholar who has authored more than 150 articles and six books, including the *Fundamentals of Ecotoxicology: The Science of Pollution*. A former Acuff Professor, he also held the position of VIMS Dean of Graduate Studies from 1999 to 2002. In 2004, the Society of Environmental Toxicology and Chemistry awarded him its Founder's Award, and in 2014, he was made a SETAC Fellow.

CARLTON HERSHNER JR.

EMERITUS 2020

Carl has served as the long-time director of the Center for Coastal Resources Management at VIMS, which provides research, advisory services, and public outreach. His primary interests include tidal and nontidal wetlands ecology, habitat restoration protocols, and science-policy interactions. He was recently honored with the Erchul Environmental Leadership Award by the Virginia Military Institute's Center for Leadership and Ethics.

KENNETH MOORE

EMERITUS 2019

Ken is a recognized leader in the preservation and restoration of seagrass habitats around the world, as well as in the Chesapeake Bay. Former chair of the Department of Biological Sciences and research coordinator for the Chesapeake Bay National Estuarine Research Reserve, he was honored with a W&M Plumeri Award for Faculty Excellence and the VIMS Outstanding Faculty Advisory Service Award.

TEACHING MARSH NAMED FOR HERSHNER

Following an outpouring of support and fundraising from his Center staff, VIMS is naming its one-acre teaching marsh in Carl Hershner's honor. This public outdoor classroom provides year-round opportunities to discover native habitats and learn about coastal resilience. To make a gift in support of the Carl Hershner Teaching Marsh Fund, please use the enclosed envelope.

Financial Highlights

Since VIMS' 75th anniversary in 2015, we have continued to expand our impact — for the Bay, the Commonwealth, and the world — thanks to an exceptionally strong base of financial support.

Public sector support includes steady investment from the federal government through competitive grants and contracts, reflecting the preeminence of our scientific research and educational programs. The increase in Virginia state funding is a powerful vote of confidence in our advisory services. State capital investments have enabled us to launch our new flagship, the R/V *Virginia*, and to engage in significant campus expansion.

We have also seen unprecedented success in private fundraising. Private support is an essential complement to public funding, allowing us to open up new areas of scientific inquiry and be on the cutting edge of advances in technology.

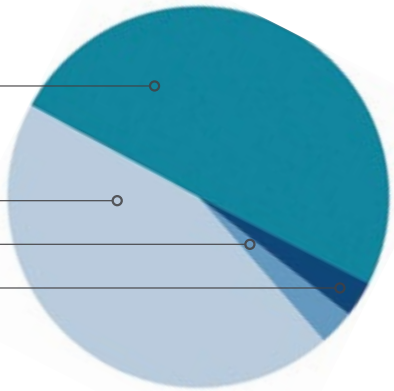
As we celebrate the completion of the *For the Bold* campaign, we thank all of our supporters for their extraordinary generosity.

We have continued to expand our impact worldwide thanks to exceptionally strong financial support.

VIMS FINANCIAL OVERVIEW

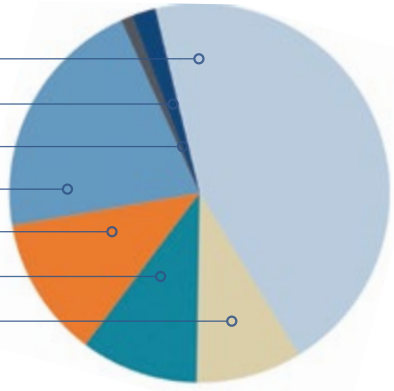
OPERATING REVENUE FY 2019

49%	General Funds	$23,241,488
	Nongeneral Funds	
44%	Sponsored Programs	$20,947,892
4%	Tuition and Other Funds	$1,783,559
3%	Private Funds	$1,307,864
Total Revenue		**$47,280,803**



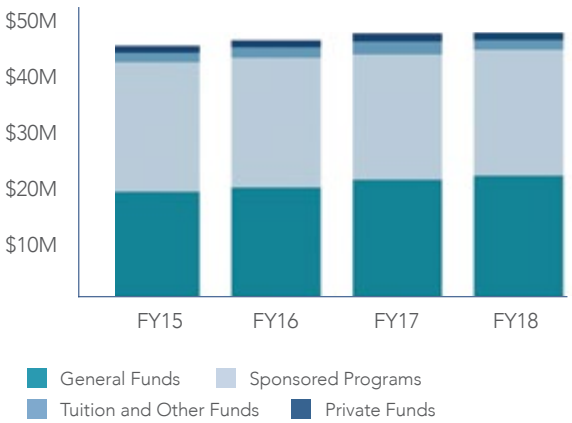
OPERATING EXPENDITURES FY 2019

45%	Sponsored Programs	$20,947,892
2%	Instruction	$1,060,187
1%	Student Financial Assistance	$535,825
21%	Research and Advisory Services	$10,025,849
12%	Academic Support	$5,590,542
10%	Plant Operations	$4,695,383
9%	Institutional Support	$4,202,676
Total Expenditures		**$47,058,354**

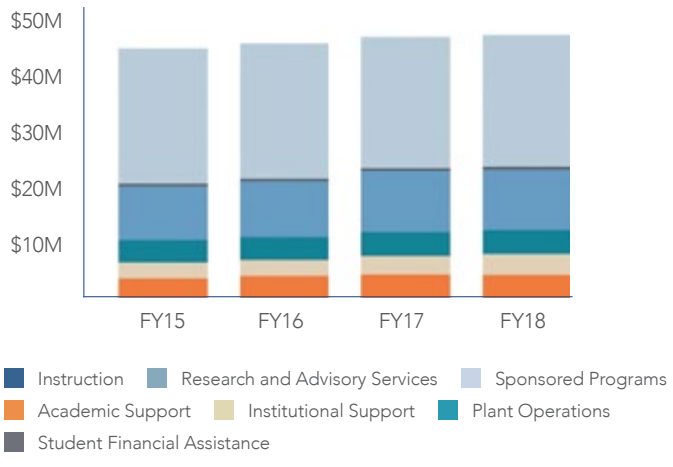


CAPITAL EXPENDITURES FY15-FY19	**$33,218,299**

REVENUE FY15-FY18



EXPENDITURES FY15-FY18



VIMS FOUNDATION

Established in 2000, the VIMS Foundation oversees the philanthropic assets supporting VIMS. Its endowments are invested by the William & Mary Investment Trust (WAMIT). The WAMIT portfolio is managed by the W&M Foundation's Investments Committee and a professional staff.

STATEMENT OF VIMS FOUNDATION FINANCIAL POSITION

Year Ending JUNE 30, 2019 (Audited)

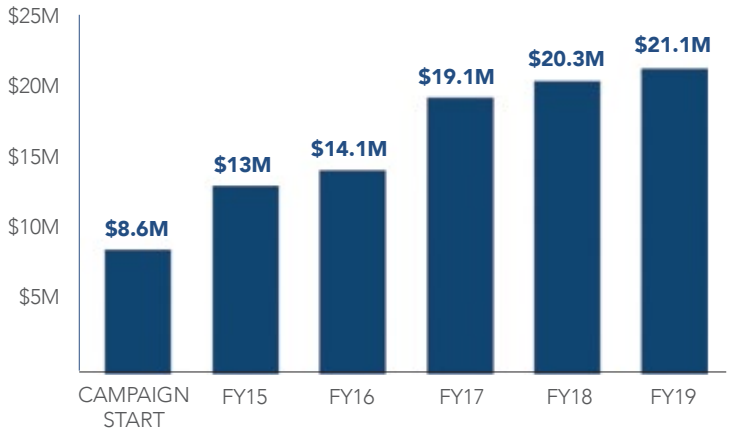
ASSETS	
Current Assets	
Cash and cash equivalents	$538,590
Pledges receivable	$237,455
Total current assets	$776,045
Investment in the W&M Investment Trust	$15,926,985
Other Assets	
Restricted cash	$643,908
Pledges receivable, net	$3,787,543
Total other assets	$4,431,451
Total assets	**$21,134,481**

LIABILITIES AND NET ASSETS	
Liabilities	$0
Net Assets	
Without donor restrictions	$2,129,337
With donor restrictions	$19,005,144
Total net assets	$21,134,481
Total liabilities and net assets	**$21,134,481**

GROWTH IN FOUNDATION ASSETS

145%

INCREASE IN FOUNDATION ASSETS
SINCE THE START OF THE CAMPAIGN



STATEMENT OF VIMS FOUNDATION ACTIVITIES

Year Ending JUNE 30, 2019 (Audited)

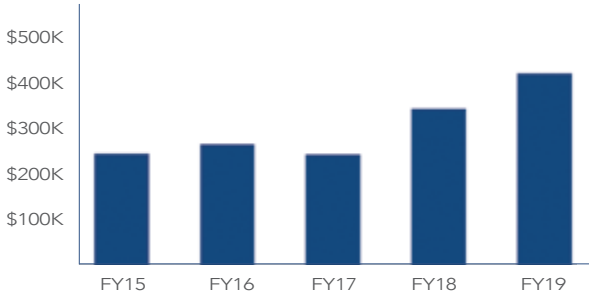
	WITHOUT DONOR RESTRICTIONS	WITH DONOR RESTRICTIONS	TOTAL
Revenue, Gains and Other Support			
Contributions			
Cash	$416,675	$723,171	$1,139,846
Noncash	$238,082	-	$238,082
Net Investment Income	$244,654	$573,540	$818,194
	$899,411	$1,296,711	$2,196,122
Net Assets Released From Restrictions	$659,229	($659,229)	
Total Revenue, Gains and Other Support	**$1,558,640**	**$637,482**	**$2,196,122**
Expenses			
Program	$842,084	-	$842,084
Management and General	$292,779	-	$292,779
Fundraising	$221,996	-	$221,996
Total Expenses	**$1,356,859**	-	**$1,356,859**
Change in Net Assets	**$201,781**	**$637,482**	**$839,263**
Net Assets			
Beginning	$1,927,556	$18,367,662	$20,295,218
Ending	**$2,129,337**	**$19,005,144**	**$21,134,481**

IMPACT BY THE NUMBERS

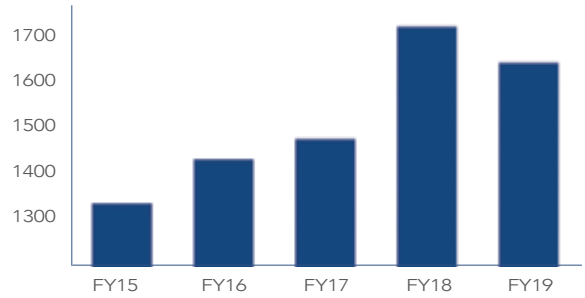
VIMS IMPACT FUND

Unrestricted annual giving provides us with the greatest flexibility in responding to current needs. Every donor makes an impact, and every gift matters.

IMPACT FUND CHANGE IN DONATIONS OVER TIME



IMPACT FUND CHANGE IN DONORS OVER TIME



CAMPAIGN GIFTS BY KIND

72.5% Community
$6,170,256 (4,428 donors)

5.3% VIMS Alumni
$299,246 (323 donors)

3.2% VIMS Faculty/Staff
$201,822 (197 donors)

14.1% W&M Alumni
$5,833,894 (863 donors)

4.9% Corporations/ Foundations*
$13,959,266 (296 donors)
*including family foundations

CAMPAIGN GIFTS BY PURPOSE

Expendable Unrestricted
$3,113,199

Expendable Restricted
$10,260,896

Endowment Unrestricted
$1,327,274

Endowment Restricted
$11,123,915

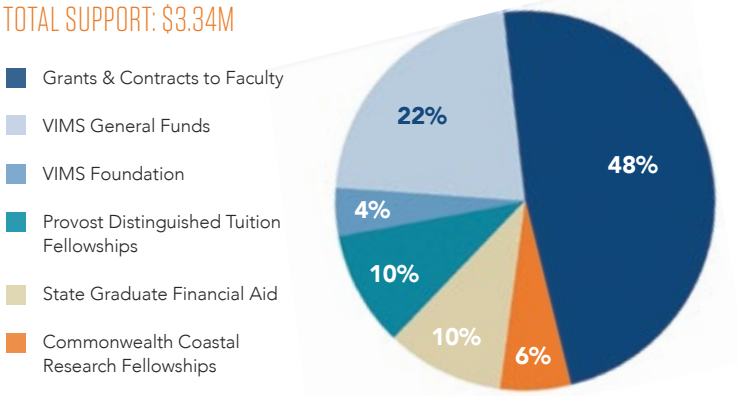
Gifts in Kind
$199,280

Facilities
$400,000

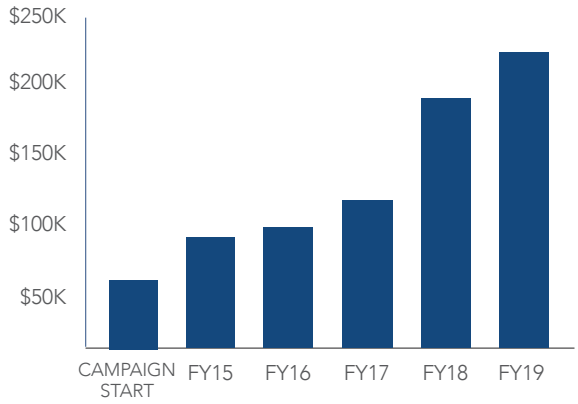
GRADUATE STUDENT SUPPORT

SOURCES OF GRADUATE STUDENT SUPPORT FY19

TOTAL SUPPORT: $3.34M



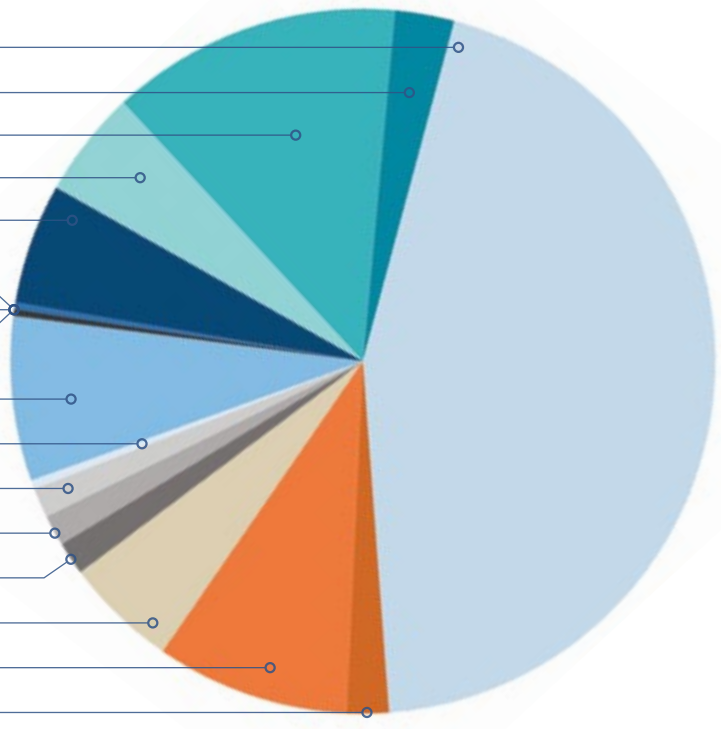
FOUNDATION TOTAL FELLOWSHIP EXPENDITURES



GRANTS AND CONTRACTS

GRANT AND CONTRACT EXPENDITURES BY AGENCY FY19

45%	NOAA	$8,796,366
3%	NIH	$538,028
13%	NSF	$2,628,941
5%	Foundation/Non-Profits	$533,657
6%	Private Companies	$1,385,696
>1%	Virginia Localities	$50,430
>1%	Non-Virginia State Agencies	$187,473
>1%	Dept of Homeland Security	$9,212
8%	Commonwealth of Virginia	$1,491,347
>1%	International Organizations	$80,102
1%	Dept of Energy	$272,680
1%	Dept of Agriculture	$276,346
1%	DoD	$299,707
5%	EPA	$1,018,020
9%	Dept of Interior	$1,746,499
2%	NASA	$378,460
Total Expenditures		**$19,692,964**



321 BETWEEN FY15 AND FY19, THE TOTAL NUMBER OF ACTIVE GRANTS FUNDING RESEARCH AT VIMS AVERAGED 321 ANNUALLY.

Want to get involved?

Keep up to date and join the conversation.

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www.vims.edu

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Impact

Email programs@vims.edu to join the mailing list and receive this print publication, issued three times a year.

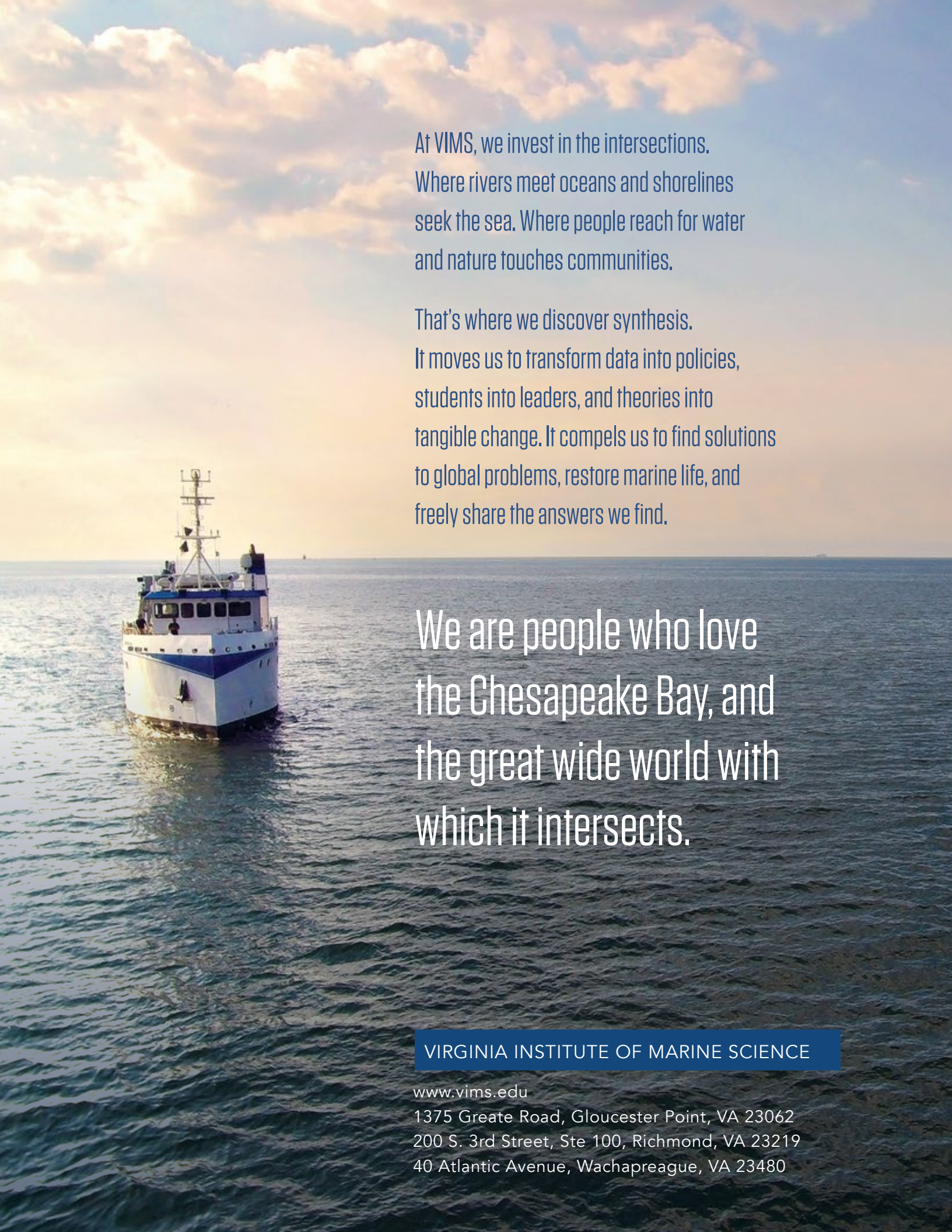
MAKE AN IMPACT WITH YOUR GIFT

Every gift makes an impact in advancing science for the Bay and the world. To make a gift of any amount, please use the enclosed envelope. Thank you!

FOR MORE INFORMATION PLEASE CONTACT:

Susan Maples, *Director of Development*
susan@vims.edu | (804) 684-7846

Sally Brooks, *Outreach Coordinator*
sabrooks@vims.edu | (804) 684-7010



At VIMS, we invest in the intersections. Where rivers meet oceans and shorelines seek the sea. Where people reach for water and nature touches communities.

That's where we discover synthesis. It moves us to transform data into policies, students into leaders, and theories into tangible change. It compels us to find solutions to global problems, restore marine life, and freely share the answers we find.

We are people who love the Chesapeake Bay, and the great wide world with which it intersects.

VIRGINIA INSTITUTE OF MARINE SCIENCE

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