

# Impact

**VIMS** | WILLIAM & MARY  
VIRGINIA INSTITUTE OF MARINE SCIENCE



Cedar Island, Eastern Shore. © K. Uhlig

## News From VIMS

### REMOVAL OF DERELICT FISHING GEAR HAS MAJOR ECONOMIC IMPACT

A study by researchers at VIMS shows that a 6-year program to remove derelict crab pots from lower Chesapeake Bay generated more than \$20 million in harvest value for area watermen.

Lead author Andrew Scheld says “it’s well known that derelict fishing



A recovered derelict crab pot from the Eastern Shore filled with blue crabs and whelks. © Mark Pruitt.

gear can harm the environment and increase crab mortality, but the economic impacts of this ‘ghost fishing’ have rarely been quantified. Our study shows that VIMS’ collaborative efforts to remove ghost crab pots from the lower Bay led to an additional 13,504 metric tons in harvest valued at \$21.3 million—a 27% increase above that which would have occurred had the pots stayed in place.”

The effort to find and remove derelict crab pots from lower-Bay waters ran from 2008 to 2014. Led by Donna Bilkovic and Kirk Havens, the program employed commercial

crabbers to find and remove derelict gear during their winter closed-fishing seasons. Crabbers lose pots to storms, boat propellers, and other causes.

“All told,” says Havens, “the crabbers removed 34,408 derelict crab pots during the program’s 6-year run. At the same time, harvests and gear efficiency were observed to increase dramatically.”

The authors attribute the harvest gains to reduced competition from derelict pots. “We estimate that crabbers harvested about 60 million more crabs due to the ghost-pot removals,” says Bilkovic. “That’s one

*“We estimate that crabbers harvested about 60 million more crabs due to the ghost-pot removals”*

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### SCIENTISTS SAY WIDELY CITED “TROPIC CASCADE” DOESN’T HOLD WATER

A new study argues that a purported link between populations of coastal sharks, cownose rays, and commercial bivalves along the U.S. East Coast is based on spurious data and reasoning, and calls for fisheries managers and others to reconsider the related campaign in the Chesapeake Bay region to “Save the Bay, Eat a Ray.”

The paper’s authors are emeritus professor Jack Musick of VIMS; Dean Grubbs and Chip Cotton of Florida State University; John Carlson, Tobey Curtis, David McElroy, and Camilla

McCandless of NOAA’s National Marine Fisheries Service; and Jason Romine of the U.S. Geological Survey. Grubbs, Cotton, and

Romine are VIMS alumni. “Recent landings of cownose rays in

Chesapeake Bay have been as high as 186 metric tons per year,” says Grubbs, the paper’s lead author. “Because we have no estimate of their overall

*“... reconsider the related campaign in the Chesapeake Bay region to ‘Save the Bay, Eat a Ray.’”*



A cownose ray feeding on oysters. © Robert A. Fisher

population, we have no idea what level of fishing mortality this represents. It also doesn’t take into account landings in other regions along their migratory

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## VIRGINIA RECEIVES \$120.5M IN NATIONAL COMPETITION

### VIMS partners in Center to increase coastal resilience

Major funding from the U.S. Department of Housing and Urban Development will help VIMS continue its leadership role in the Commonwealth's comprehensive effort to better understand the threats posed by coastal flooding and increase the resiliency of Virginia's coastal communities.

Virginia received \$120.5 million in federal funding—announced on January 21 in Norfolk by HUD Secretary Julian Castro and Virginia Governor Terry McAuliffe—in response to the Commonwealth's successful application to the National Disaster Resilience Competition. Overall, HUD awarded nearly \$1 billion to 8 states and 5 cities affected by natural

*"The Accelerator Center will transform the challenge of sea-level rise into an opportunity for Virginia"*



### DID YOU KNOW?

Virginia has thousands of miles of shoreline. The shoreline of the tidal portions of Chesapeake Bay and its tributaries stretches 7,213 miles. Adding the Maryland portion of the Bay brings the total length of Chesapeake Bay's shoreline to 11,684 miles—more than the entire west coast of the United States.

disasters between 2011 and 2013.

Virginia's qualifying event was Hurricane Irene, which killed 5 people, left 1.1 million without power, and cost at least \$182 million when it impacted the Commonwealth in August 2011. In total, Irene claimed 47 lives and cost the U.S. more than \$15 billion in property damage as it moved up the East Coast.

Virginia's HUD award goes to two projects: a \$112-million plan to increase resiliency in Norfolk's Ohio Creek watershed through construction of flood walls, living shorelines, raised roads, and other infrastructure improvements, and the remainder to a "Coastal Resilience Laboratory and Accelerator Center" that will serve as a hub for technological and organizational innovation. VIMS will participate most directly in the Center.

VIMS Dean and Director John Wells says "The Accelerator Center will transform the challenge of sea-level rise into an opportunity for Virginia, bringing our best minds together to develop real-life solutions that benefit Hampton Roads and can be shared with the rest of the world."

### *Derelict Fishing Gear, continued from page 1*

extra blue crab each time a pot is retrieved—crabs that would have otherwise been captured or attracted to the now absent derelict gear."

### Return on Investment

The program to remove derelict crab pots from lower Chesapeake Bay was paid for through disaster-relief funds made available in 2008 when the US Department of Commerce declared the Bay's blue crab industry a "commercial fishery failure" following many years of declining harvests.

The researchers' analysis shows that the program was a sound investment, with its \$4.2 million price tag over 6 years easily recouped by the extra \$21.3 million in blue crab revenues earned.



*A waterman retrieves a derelict crab pot using a tow rope that is studded with hooks to snag the crab pot's mesh sides.*

## SUZETTE KIMBALL SWORN IN AS USGS DIRECTOR

Former VIMS scientist Suzette Kimball was sworn in on January 8 as the director of the United States Geological Survey, the chief science agency of the U.S. Department of the Interior.



"I am pleased the Senate voted

to confirm Dr. Suzette Kimball to this important leadership post in the Administration," said Secretary of the Interior Sally Jewell on Kimball's confirmation. "As a geophysicist and veteran of decades in public service, Dr. Kimball is eminently qualified to lead the USGS." Responsibilities of the USGS range from mapping and LANDSAT satellite images used by people around the world, to helping communities understand and prepare for natural events such as flooding, earthquakes, and volcanic eruptions.



Recognizing that removal funds are limited, the scientists recommend a combination of preventative and mitigating measures to most effectively deal with derelict gear. "Ensuring both that crab pots have biodegradable escape mechanisms and that removal efforts target areas of highest fishing pressure are likely to yield benefits superior to any single strategy alone," says Scheld.



## FIRST LADY OF VIRGINIA COOKS, DINES WITH LOCAL KIDS AT VIMS

Eight second-grade students from local elementary schools visited VIMS in the fall to learn about the link between a healthy Chesapeake Bay and the seafood they eat with Virginia's First Lady Dorothy McAuliffe and Virginia Executive Mansion Chef Ed Gross.

The event—A Healthy Bay for Healthy Kids—allows young students the opportunity to learn the importance of keeping the Bay healthy in order to have fresh, sustainably harvested Virginia seafood for the table, and how that contributes to a healthy diet. The students prepare and enjoy a tasty seafood lunch to enjoy with the First Lady and their parents, and take the knowledge and recipe back to their classrooms.

Visit [www.vims.edu/news](http://www.vims.edu/news) to watch the video.



*Virginia's First Lady Dorothy McAuliffe and Virginia Executive Mansion Chef Ed Gross teach local second-graders how to make blue crab and cabbage coleslaw using locally-grown ingredients.*



**Subscribe to e-Tidings – VIMS' monthly e-newsletter – to stay “in the know” about our upcoming public events and latest research.**

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- \* New issues each month**
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### **Crab & Cabbage Coleslaw Wrapped in Lettuce**

**Ingredients:**

- 1 head of lettuce
- 1 small cabbage cut thin
- 1 sliced bell pepper
- onion sliced in half rings
- cup apple cider vinegar
- 2 tablespoons honey
- 1 apple sliced in strips
- 4 tablespoons plain yogurt
- 1 pound crab meat
- Salt to taste

**Directions:**

- In a large salad bowl, combine cabbage, bell pepper, onion, apple, and crab meat, and toss gently.
- In a small bowl, whisk together vinegar, honey, yogurt, and salt.
- Pour the dressing over the cabbage mixture until coated.
- Place a small amount of crab coleslaw onto a lettuce leaf and wrap. Eat well and enjoy!
- Serves 8

**Prepared By:**

Virginia Executive Mansion Chef Ed Gross

## VIMS AFTER HOURS LECTURE SERIES

This monthly series of public lectures by scientists from VIMS and elsewhere explores hot issues facing Chesapeake Bay and the ocean. Lectures are held on VIMS'

Gloucester Point campus, and offered to the public free of charge. Reservations are required as seating is limited. Some lectures are also offered as a webinar for those that can't attend

in person. In addition, VIMS' Eastern Shore Laboratory in Wachapreague will host a space to watch certain webinars with scientists and staff. For reservations and information, visit [www.vims.edu/afterhours](http://www.vims.edu/afterhours) or call 804.684.7061.

- March 31 – Whimbrels**
- May 3 – Hokule'a**
- June 30 - Sharks**
- July 28 - Billfish**
- August 25 – Coral Reefs**
- September 29 – Harmful Algal Blooms**
- October 27 - Eels**







## STUDY PREDICTS SALT MARSHES WILL PERSIST DESPITE RISING SEAS

A new study in *Nature Climate Change* contends that traditional assessment methods overestimate the vulnerability of salt marshes to sea-level rise because they don't fully account for processes that allow the marshes to grow vertically and migrate landward as water levels increase.

The persistence of salt marshes despite rising seas would be a rare bit of good news for coastal ecosystems, which are under threat from a host of factors including nutrient pollution, invasive species, and development. Healthy marshes buffer coasts from storms, improve water quality, provide habitat for commercial fisheries, and help fight global warming by trapping carbon.

Lead author Matt Kirwan, a professor at VIMS says "Catastrophic predictions of marsh loss appear alarming, but they stem from simple models that don't simulate the dynamic feedbacks that allow marshes to adapt not only to present rates of sea-level rise but the accelerated rates

predicted for coming decades. Marsh soils actually build much faster as marshes become more flooded."

Looking at recent history, the researchers note that the feedbacks built into more advanced, dynamic models help explain the observed stability of many salt marshes in the mid-Atlantic and elsewhere during recent decades, and the relative rarity of marshes that have already drowned. Where drowned marshes do occur—think the Mississippi delta or Venice lagoon—the culprit is a reduced sediment supply, due to dam or levee building, or increased subsidence due to groundwater withdrawal and other factors.

The researchers temper their optimism with a cautionary note

about the importance of allowing salt marshes to migrate horizontally as rising seas push them landward. They note that in low-lying areas of the U.S. Atlantic Coast, migration into nearby forests could offset most of the loss of existing salt marshes.

But marsh migration isn't possible where obstructed by coastal cliffs or human barriers. "Almost 20% of the Chesapeake Bay shoreline is hardened by riprap, seawalls, and other structures," says Kirwan, "and similar structures border almost all marsh areas in northwest Europe. We suggest that the availability of low-lying land for wetland migration is a first-order determinant of marsh fate."

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### *Cownose rays, continued from page 1*

path, or from bow-fishing tournaments or bycatch." "Cownose rays have one of the lowest reproductive capacities of any fish species," says Musick. "They don't mature until they're about 8 years old, and produce only 1 pup per year."

The authors "strongly recommend establishing precautionary, science-based catch limits rather than allowing continued unregulated exploitation of cownose rays" and recommend 5 criteria for assessing current and future claims of trophic cascades. Read the complete story at [www.vims.edu/news](http://www.vims.edu/news).



*The first annual Mermaid Cup golf tournament was a success! Photo: (Left to Right) Don Sproul, President of the Peninsula District of the Associated General Contractors of Virginia, presents a check to Dr. John Wells, Dean and Director of VIMS, VIMS Council member Adrian G. "Casey" Duplantier, Jr., and VIMS Associate Director of Development Jennifer Dillon. The \$4,000 donation to the VIMS Foundation will support VIMS' research, education, and advisory services. Information and registration for the Mermaid Cup 2016 will be available soon!*

## GET A BEHIND-THE-SCENES LOOK AT VIMS

Reserve space on our **summer public tours** to learn more about VIMS. These 1.5 hour guided walking tours are most interesting for adults and older children (9 and up welcome). All include a guided tour of VIMS' Visitor Center, a visit to a laboratory, and the Nunnally Ichthyology Collection or Teaching Marsh. No Charge. All tours are 10:30 a.m. - 12:00 p.m. Space is limited and reservations must be made at least two days in advance. Visit [www.vims.edu/public](http://www.vims.edu/public) or call 804-684-7061.



*Dr. Mike Unger shares current research.*

## OYSTOBERFEST

VIMS hosted Oystoberfest on its Gloucester Point campus on October 23rd to celebrate our 75th anniversary, along with recent breakthroughs in aquaculture research. The event gave local supporters and Chesapeake Bay enthusiasts the opportunity to enjoy an evening of live music, bratwurst, craft beer, and all-you-can-eat oysters.



*At Oystoberfest VIMS alumnus Charlie Natale (left) recognized Emeritus Professor Maurice (Mo) Lynch and his wife Virginia (Gin) for being the longest supporting donors on record with more than 30 years of giving.*

**Fellowships and programmatic support from individuals and foundations provide the resources that strengthen the mission of VIMS. Below we celebrate a few of our recent gifts and say thank you to our generous donors.**

### *Shelton Hardaway Short, Jr. Graduate Teaching Scholars*

Building on the success of the Shelton Short Foundation gift to support graduate student teaching in K-12 classrooms, we are pleased to share that the Foundation will support a second year of Graduate Teaching Scholars. The successful program pairs VIMS graduate students with experienced teachers at regional schools. Scholars work for a semester in the classroom as “resident scientists” sharing their knowledge, research experience, and creativity to develop engaging activities that support STEM curricula while cultivating skills in teaching/communicating science to non-scientists. The program brings marine and environmental science to middle and high school students while growing the professional expertise of teachers and graduate students.

### *MacWhorter Family Fellowship and Graduate Teaching Scholars/ K-12 Teaching Program*

Last fall Ms. Althea MacWhorter learned about the success of the Graduate Teaching Scholars program and she made a generous gift to help grow the program. She said “I was a teacher and to have the

opportunity to learn science from someone who lives it every day is a great opportunity for not only K-12 students but also for their teachers. Learning to communicate science to non-scientists is a very important skill, both my daughter and son-in-law are marine scientists at VIMS and their enthusiasm for sharing their research is wonderful.” In addition to supporting the graduate teaching scholars, Althea created the MacWhorter Family Fellowship Endowment for graduate student researchers at VIMS.

### *Brenton S. Halsey Fellowship*

Emeritus Council member, lifelong sailor, and friend to VIMS, Mr. Brent Halsey created an endowment in the VIMS Foundation to support graduate student researchers. Brent grew up in Newport News and has lived along the waters of the James River all of his life. His deep appreciation and love of the oceans and of the health of the Bay have kept him in touch with the work of VIMS. “I have known about VIMS and the great research that it does for many years. I am happy to be able to support a future marine scientist in their endeavors to do research that will benefit the waters that we all enjoy.”

*Gifts like these help to strengthen the academic program at VIMS and provide resources for our students for generations to come.*



The Matthew Fontaine  
Maury Society

## JOIN THE MAURY SOCIETY TODAY

Maury Society members—VIMS supporters who make donations of \$1,000 annually—are honored and celebrated at VIMS events, listed in the VIMS honor roll, and receive special recognition in our annual report. To become a member of the Maury Society, visit [www.vims.edu/impact](http://www.vims.edu/impact), and make your gift today.



## ONE TRIBE ONE DAY

VIMS and the entire William & Mary community will band together on April 19th to celebrate One Tribe One Day — the third annual giving day for the university. For 24 hours, students, alumni, parents, faculty, staff, and friends can make a gift of any size to any facet of William & Mary and add their support to the record-breaking effort. The university has established [www.wm.edu/otod](http://www.wm.edu/otod) to serve as the central rallying point for giving, information, and social media. Last year, the event raised more than \$1.3 million from 6,078 donors, including 71 with gifts specifically earmarked for VIMS. Hundreds of volunteers built momentum on social media, through personal outreach and at 22 events from Tokyo to San Francisco. Keep an eye on the VIMS Facebook page to participate this year.



*The Griffin reenacts his favorite scene from the movie Titanic aboard the R/V Bay Eagle for One Tribe One Day 2015. © Erin Fryer*

## VIMS HOSTS WORKSHOP TO IDENTIFY AND CATALOG LARVAL FISHES

A two-week Larval Fish Workshop was hosted by VIMS in October to introduce students, collection managers, and other professionals to the study, identification, and care of specimens representing the earliest life stages of bony fishes.

VIMS is home to the Nunnally Ichthyology Collection—the largest fish repository in the state—which in addition to more than 300,000 adult specimens of freshwater, Chesapeake Bay, and deep-sea fishes, maintains a sizable collection of larval fishes derived from research cruises worldwide, including extensive collections made as time series in the Northwest

Atlantic, south-central Atlantic, Central Pacific, and Southern oceans.

The workshop was funded by a grant from the National Science Foundation's *Collections in Support of Biological Research* program, with an overall goal to safeguard VIMS' larval fish collection and preserve it for current and future scientific research. Spearheaded by collection curators and professors Eric Hilton and Sarah Huber, and VIMS professor Deborah Steinberg, the workshop also featured five experts in larval fish taxonomy from across the globe.

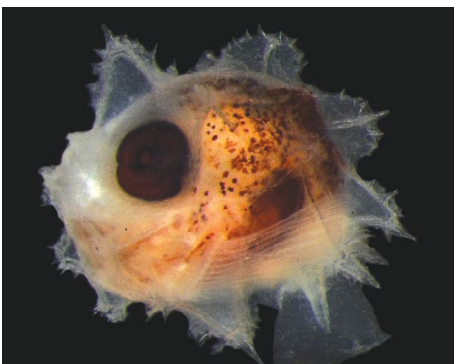
The specimens in the larval fish collection were sampled serendipitously during one-time and recurring zooplankton studies in oceans around the world. These field projects—including long-term time series in the subtropical Atlantic and Southern oceans, and comprehensive studies of how physical features such as mesoscale eddies and the Amazon River plume affect plankton distribution—represent some of the largest investments the



*Participants learn the study, identification, and care of specimens representing the earliest life stages of bony fishes. © Erin Fryer*

National Science Foundation has made in interdisciplinary oceanographic research in the past two decades. Huber says, “The proper storage, identification, and digitization of these fishes will secure them and increase their value.”

“Collections of larval fishes are relatively rare,” says Hilton, “but they are important for a variety of different disciplines, from systematics and evolution to ecology and global climate change. The specimens housed at VIMS lend themselves to examining the effects of global environmental changes because they were collected as multi-year time series, from the same localities using the same methods.”



*A larval Slender Sunfish (Ranzania laevis) from a plankton collection made in the central Pacific Ocean. ©Eric Hilton and Peter Konstantinidis*





## VIMS Marine Science Day 2016

VIMS' annual open house is a fun-filled event for the whole family. Join us in Gloucester Point on Saturday, May 21st, for exhibits, children's activities, seining on the York River, lab tours, and much more. All activities are free, as is parking.

### *VIMS in the Bay and Around the World*

Ocean research takes VIMS scientists from Poquoson to the Poles. Speak with scientists to learn about efforts in Chesapeake Bay to manage blue crabs, restore oysters, survey fish populations, unravel biodiversity, monitor water quality, and more. Also learn about our international work in Antarctica and the deep sea.

*"Thanks for organizing this! Loved the enthusiasm of the students at the Sediment Coring and the great jobs done patiently explaining by the Seagrass Greenhouse people! Appreciate everyone's hard work to make this available to the public!"*  
(Marine Science Day participant)

### *Open Labs, Activities, & Tours*

Tour a working laboratory to learn about the latest tools and techniques of marine research. Learn and have fun with crafts and other activities in our Children's Pavilion with this year's theme "Sounds of the Sea." Tour our Teaching Marsh, Shellfish Hatchery, and Riparian Forest. Collect, observe, and better understand estuarine organisms from the York River. Make sure to stop by our Wacky Science Photo Booth to find yourself in an unexpected scene!

### *By the Clock*

In addition to our day-long activities, we offer a series of events that begin at specific times. These events include 10-minute Fast Talks, a seafood cooking demonstration, the Marine Life Costume Contest, and Artwork Awards Ceremony.

For more information, visit [www.vims.edu/msd](http://www.vims.edu/msd) or call 804.684.7061.

This event is made possible through the support of corporate and individual sponsors. To find out how you can become a sponsor, call 804.684.7784.



## VIMS Marine Life Costume Contest

*Create a marine-themed costume to participate in our Marine Science Day contest*

Everyone, every age, can participate by creating original costumes of marine plants or animals. Individuals and groups are welcome. Ribbons are awarded for most original plant or animal; most creative use of materials; best group costume; and best representation of a plant or animal. *The overall winner will earn a \$50 gift certificate to VIMS' gift shop.*

**For more information and to register, complete the online form at [www.vims.edu/msd](http://www.vims.edu/msd)**



## UPCOMING EVENTS

### **Thursday, March 31, 7PM**

#### **After Hours Lecture: Whimbrels**

Join us to learn about this shorebird - an Eastern Shore visitor. No charge: Adults and 10+

### **Tuesday, April 19, 6PM**

#### **Discovery Lab: Bivalves**

Hands-on learning; oysters, clams, and scallops in the Bay Family-friendly. No charge.

### **Tuesday, April 19th**

#### **One Tribe One Day**

VIMS and the W&M community rally to support the university. Online; Everyone.

### **Tuesday, May 3, 7PM**

#### **After Hours Lecture: Hokule'a**

Learn the art of wayfinding and ways to a sustainable future. No charge: Adults and 10+

### **Saturday, May 21, 10AM – 3PM**

#### **VIMS Marine Science Day**

Open house: tours, exhibits, hands-on activities, and more. No charge: All ages.

### **June – July, select dates,**

**1:30-4:30PM**

#### **Visitors Center Activity Days**

Hands-on activities and an up-close look at bay animals. No charge: Family-friendly.

### **June – September, select days**

#### **Summer Public Tours**

1.5-hour guided walking tour includes laboratory visit. No charge: Adults and 9+

### **Tuesday, June 21, 6PM**

#### **Discovery Lab: Plant Adaptations**

Make a field guide and taste salt from a blade of marsh grass. Family-friendly. No charge.

### **Thursday, June 30, 7PM**

#### **After Hours Lecture: Sharks**

Learn about research to deter sharks from fishing gear. No charge: Adults and 10+

*Reservations required for most events. Visit [www.vims.edu/events](http://www.vims.edu/events) or call 804.684.7061*

[www.vims.edu/impact](http://www.vims.edu/impact)

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VIRGINIA INSTITUTE OF MARINE SCIENCE

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