William & Mary | VIMS Virginia Institute of Marine Science
Press Release

VIMS scientists earn Sea Grant awards for marine research

By Janet Krenn / December 19, 2010

Researchers at the Virginia Institute of Marine Science secured nine of the twelve grants that will be awarded through Virginia Sea Grant's research program in February 2011.

In total, VIMS faculty and their research teams will receive $354,422. Five grants will support graduate student research in the College of William and Mary's School of Marine Science at VIMS.

Virginia Sea Grant Director Troy Hartley says the selected projects will supply critical information that will help Virginians address specific management challenges in Chesapeake Bay and along the coast.

"This year's funded research covers a wide spectrum of coastal and marine research needs, directly related to serious issues facing the Commonwealth," says Hartley. The selected projects address issues in sustainable fisheries and aquaculture, seafood safety, and science to support ecosystem-based management.

Research contributing to sustainable fisheries and aquaculture includes projects investigating new fish species for use in aquaculture and studies of mortality of summer flounder and striped bass in Chesapeake Bay. The mortality studies will give researchers better population estimates, thereby helping managers and industry to access resources sustainably and reduce the risk of population decline.

Minimizing risk is especially important when it comes to food safety. Some funded projects will look at whether shellfish near different types of development are more susceptible to disease; another project will catalogue mercury contamination of different finfish species in Virginia's waters.

To reach the goal of ecosystem-based management, researchers need to answer questions about how one part of the ecosystem affects another. For example, one funded project will measure whether clams affect nitrogen levels in surrounding waters. Nitrogen is a nutrient that will be regulated under the Chesapeake Bay's new Total Maximum Daily Load (TMDL) plan. Other projects cover everything from water quality and restoration to mapping best places for seagrass beds and the food web within the Bay.

"We are pleased with the diversity of topics that the selected research projects will address," say Susan Park, Virginia Sea Grant Assistant Director of Research, who notes that the next request for proposals will be released in early 2011.

More than 40 proposals were received during the current round of Sea Grant funding. In addition to VIMS and the College of William & Mary, funded projects went to researchers with the University of Virginia, Virginia Tech, and Old Dominion University. Other collaborators hail from the Smithsonian Environmental Research Center, Southern Illinois University, and the National Oceanic and Atmospheric Administration.

In total, Virginia Sea Grant will award $535,899 across the Commonwealth, with about $192,000 going to support graduate students, $233,000 to preliminary investigations, and $111,000 to large-scale research.

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Virginia Sea Grant—part of a larger network of Sea Grant programs housed in 31 colleges and universities around the country—facilitates research, educational, and outreach activities promoting sustainable management of marine resources.

Funded Projects

Clam aquaculture and movement of nutrients

Virginia leads the U.S. in aquaculture production of the hard clam *Mercenaria mercenaria*. VIMS professors Iris Anderson, Mark Brush, and Mark Luckenbach will study the movement of nitrogen in and around clam beds to better understand the effects of intensive clam aquaculture on Chesapeake Bay habitats. This information will help clam farmers optimize clam production and inform decisions about how and where to allocate space and resources to clam farming and competing uses.

Mapping habitat for a struggling turtle

The diamondback terrapin *(Malaclemys terrapin)* is listed in Virginia as a species of "Very High Conservation Need" based on threats due to nest predation and drowning of adults in commercial-style crab pots. Donna Bilkovic and Kirk Havens of VIMS and Randy Chambers and Matthias Leu of William and Mary will map likely diamondback terrapin habitats and study the overlap of those areas with threats to turtles, such as crabbing. The results will allow managers to target conservation efforts in areas where terrapins are most likely to encounter threats.

Understanding predators before restoring Bay scallops

Bay scallops haven't been recorded in Virginia's seaside bays for more than 80 years, but there has been an on-going effort to restore them since 2009. Efforts to restore bay scallops could be hampered by low survival of juvenile scallops, but little is known about predation on these tiny juveniles. This grant will support a student working with VIMS professors Emmett Duffy, Robert Orth, and Mark Lukenbach to study, both in the field and in the lab, what eats juvenile bay scallops.

Predicting success of young flounder and bass

Fish species such as striped bass and summer flounder can show remarkable fluctuations in abundance from year to year. These fluctuations are rooted in differences in the success of spawning and the survival and health of young fish. This grant will support VIMS Ph.D. student Ryan Schloesser working with professor Mary Fabrizio to measure the lipid content of young striped bass and summer flounder collected by the VIMS trawl survey in different parts of Chesapeake Bay. This information will help improve the methods that fisheries managers use to measure the success of cohorts of young fish and predict future abundance of adult fish.

Preventing shellfish-borne disease

Adenovirus and norovirus can be released from wastewater treatment plants and can contaminate shellfish and cause gastrointestinal illness in people who eat those shellfish. However, routine and reliable methods to measure the presence of norovirus in water have not been developed. This grant will support a student working with VIMS professors Howard Kator and Kimberly Reece to explore whether contamination with adenovirus indicates presence of norovirus in local estuarine waters and shellfish. If so, adenovirus can be measured in the future as an indicator of norovirus contamination.

Using the fish food web to plan ahead

Ecosystem-based fisheries management incorporates information about multiple species and their habitats and interactions into a more comprehensive and accurate system for keeping fisheries sustainable. This requires comprehensive data and analyses of the interaction between species and environmental factors. This grant will allow VIMS Ph.D. student Andre Buchheister and professor Robert Latour to analyze fish dietary data collected by the

Chesapeake Bay Multispecies Assessment and Monitoring Program since 2002. This analysis will determine the food-web relationships between different fish species and allow examination of the effects of factors such as fishing, weather, and food availability on fish species and their interactions.

Database of mercury in Chesapeake Bay seafood

When scientists talk about mercury in fish, they often refer to three categories of fish: bottom feeder, middle predator, or top predator. But these categories don't provide consumers with useful information about the risk or benefit of local seafood they might eat. Using samples caught during a 2009 trawl survey, VIMS professors Newman and Mary Fabrizio will analyze finfish for mercury and develop a database of mercury levels in fish based on fish species and size. By connecting mercury data with fish characteristics that are easy to observe, researchers may be able to help consumers more easily understand the risk or benefit of eating a particular fish.

Effect of algal blooms on oysters

Harmful algal blooms occur regularly in Chesapeake Bay, and these blooms could have negative effects on oysters grown for human consumption and for restoration. Kimberly Reece, Wolfgang Vogelbein, Thomas Harris, and Ryan Carnegie, all from VIMS, will study the effects of algal-bloom toxins on larval and adult oysters. By understanding the toxicity of these chemicals, oyster growers and restorers can decide whether to relocate or temporarily remove their oysters.

Effects of low oxygen and disease on striped bass

Striped bass prefer the cool waters deep in Chesapeake Bay, but in the last 50 years, these places have experienced extensive deep-water hypoxia, or lack of oxygen. Researchers are wondering how the stress of low-oxygen zones combined with a common contagious disease might affect the survival of resident striped bass. Researchers Wolfgang Vogelbien and Mary Fabrizio of VIMS, Richard Brill of the National Oceanic and Atmospheric Administration, and David Gauthier of ODU will study the ability of striped bass to breathe under low oxygen conditions in the laboratory and will compare that ability to wild-caught fish with and without mycobacteriosis to determine whether infection makes fish more vulnerable to oxygen stress.