



VIRGIN  
ISLANDS

epscor

FALL 2016 VIRGIN ISLANDS EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH



### We Welcome A New Director

Dr. Thessalenuere (Thess) Bernard joins the University of the Virgin Islands in the dual role of Director for the VI-EPSCoR program, and Director for the Caribbean Green Technology Center. Dr. Bernard brings a wealth of expertise, having served as an Associate Director of a CDC funded grant in the Office of Community Health and Research at the University of Arkansas for Medical Sciences; at Rutgers University as the Assistant Director for a National Science Foundation funded ADVANCE-IT program; at the University of Maryland Eastern Shore as Associate Research Director/Visiting Associate Professor for the School of Agricultural and Natural Science; at the University of Kentucky as an Extension Specialist for special projects in the School of Human Environmental Sciences; and as Assistant Professor/Research Scientist in the School of Agricultural and Environmental Sciences at North Carolina A&T State University. We are pleased to have her at the helm.

## Mare Nostrum Caribbean

VI-EPSCoR is a territorial program of the National Science Foundation hosted by the University of the Virgin Islands. Mare Nostrum Caribbean was awarded funding by the NSF in August 2014.



Participants of the *Marine Debris Teacher Education Workshop* examine microplastic samples.

### Marine Debris Education and Funding

Marine debris in the U.S. Virgin Islands is a real and persistent problem. Researchers at the University of the Virgin Islands were therefore excited to receive more than \$95,000 in funding for marine debris education and prevention from the National Oceanic and Atmospheric Administration (NOAA).

This 18-month project kicked off with a Marine Debris Educator Workshop at UVI on October 4, 2016. Thirty educators from St. Thomas and St. Croix were introduced to marine curricula and other resources designed to be taken into the classrooms for student education opportunities. Additionally, more than \$20,000 is available for year-long, community-based projects involving teachers, students and community partners with the goal of reducing land-based sources of marine debris. Dr. Kristin Grimes, UVI Research Assistant Professor of Watershed Ecology and Director of the Virgin Islands Water Resources Research Institute, noted what an exciting opportunity this is for the USVI.

## Zooplankton Abundance and Distribution in the Territory

Under the guidance of Dr. Sennai Habtes, professor of biological oceanography at UVI CMES, MMES candidate Mara Duke is studying zooplankton abundance and distribution surrounding Brewers Bay. The purpose of this study is to gain insight into how environmental conditions impact all levels of the ecosystem, within a small coastal bay with highly diverse habitat types. Mara's research includes monthly measurements of oceanographic conditions and samples of water quality at 33 stations in Brewers and Perseverance Bays, and at Flat Key, as well as identifying and quantifying the zooplankton from four plankton tows spread out among the study area. Oceanographic data is collected as well. Salinity, temperature, depth, chlorophyll and turbidity are measured, as is the presence of enterococci and fecal coliform bacteria, nutrient concentrations, and total suspended solids.



Mara Duke at work onboard the Nancy Foster

Mara was one of four graduate students invited to take part in the Coral Reef Ecosystem Research cruise onboard NOAA research vessel Nancy Foster.

## CMES Celebrates The Completion Of A Year-Long Project

The Center for Marine and Environmental Studies celebrated the completion of their new dock and boat ramp. 50' longer than the previous structure, all of the current research vessels can now dock simultaneously. It can also accommodate larger boats, in anticipation of a new, 40'-50' coastal oceanographic vessel slated for purchase in the next year. The addition of the boat ramp is a tremendous asset as well. Also upgraded is the water intake pipe which is now further out and deeper, ensuring cleaner water for researcher's sea tables.



Construction of the new dock and boat ramp at CMES is completed in November 2016

## Cheap, Simple, Fast: New Methods For Mapping Deep Coral Reefs

The study of mesophotic (deep-water) coral reefs continues to transform our understanding of reef systems. These coral ecosystems, found at depths of 100'-330' may be more abundant than their shallow counterparts. In some cases they may be refuges from a changing climate that is threatening shallow coral reefs around the globe.

Because of the extreme depths however, the study of mesophotic reefs is incredibly costly and risky. Viktor Brandneris and Dr. Tyler Smith, researchers at UVI's Center for Marine and Environmental Studies experimented with low-cost miniature high-definition cameras (e.g., GoPro). They developed a system to deploy protected cameras to the seafloor by dropping them on a buoy from small boats. This system has now been used to map areas of mesophotic coral ecosystems around the USVI, Curacao, and Montserrat in collaboration with public and private partners. Over six times the sampled area can be covered in a single day relative to technical diving. This gives an excellent picture of the ecosystem and is finally opening these areas to exploration and scientific discovery.

# St. Croix Research Projects

The University of the Virgin Islands Center for Marine and Environmental Studies and VI-EPS-CoR have launched new research projects on the island of St. Croix in collaboration with DPNR, National Park Service, NOAA, USGS, and 6 other institutions and organizations. Both projects use acoustic telemetry, which consists of a transmitter or pinger attached to a fish, and receivers or listing stations placed around the study area. As tagged fish swim past the receivers, it records the date, time, and identification number of the fish. A total of 50 receivers were deployed in October 2016.

## Understanding Movement Patterns Of The Invasive Lionfish

This study is in collaboration with Dr. Stephanie Green, Stanford University and Mr. Lad Akins, Reef Environmental Education Foundation. This project has set up a very tightly clustered array of receivers into a virtual positioning system, which allows us to track movements of lionfish within a few meters. Our goal is to understand how active lionfish are. For example after divers removed all the lionfish from several coral reefs, some reefs were repopulated with lionfish very quickly while others were not. Researchers are trying to understand what drives these movement patterns; information that may be important for lionfish management and control.

## Hawksbill Turtle DNA Is Studied on Buck Island, St. Croix

For the first time ever, male hawksbill turtles are being investigated in the U.S. Virgin Islands; and specifically, on Buck Island, a small cay north of St. Croix.

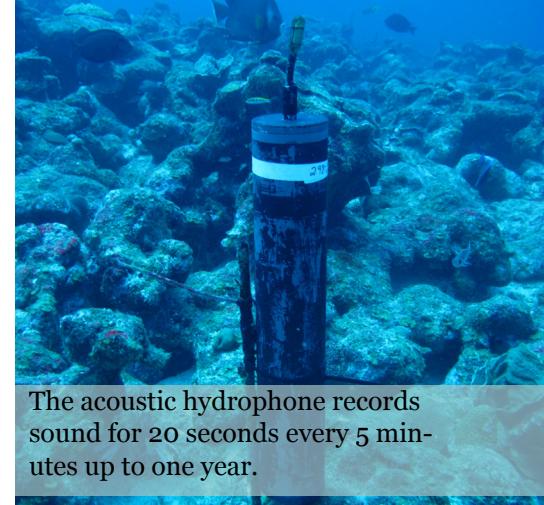
UVI graduate student Paul Hillbrand is identifying individual male hawksbill turtles using genetic markers to estimate how much each individual contributes to the nesting population on Buck Island. By collecting tissue samples from females and their respective hatchlings, Hillbrand will compare their DNA samples to identify individual males. Keeping long-term accounting of these numbers could help inform if climate change is allowing for more females to develop in the nests. The males are a crucial component in the conservation and management of this endangered species.



The lionfish is an indiscriminate and hungry feeder. Lameshur Bay, St. John.



Photo courtesy of K.C. Webster



The acoustic hydrophone records sound for 20 seconds every 5 minutes up to one year.

## How Effective Is The EEMP In Rebuilding Fish Populations?

In collaboration with DPNR, this project aims to understand the effectiveness of the East End Marine Park (EEMP) in rebuilding populations of marine fish. Are fish moving between no-take areas and recreational zones? This study is also trying to examine the linkages or connectivity between EEMP and waters around Buck Island National Monument. The EEMP project is targeting commercially important species that migrate between resting sites and feeding sites, and may also undergo spawning migrations. Target species include snapper, grunts, parrotfish, and groupers. One recent exciting finding was the capture and tagging of the endangered Nassau grouper, which was once common, but now very rare on St. Croix.

Passive acoustic hydrophones (Digital Spectrogram Long-Term Acoustic Recorder or DSG) records sounds underwater. Traditionally used for recording the songs of humpback whales, it is used in St. Croix to monitor grouper spawning sites. So far, scientists have validated the vocalizations of 4 species: red hind, Nassau grouper, yellowfin grouper, and black grouper.



VI-EPSCoR is hosted by

The University of the Virgin Islands  
#2 John Brewers Bay  
St. Thomas, VI 00802  
(340) 693-1422  
vi\_epscor@myuvi.net  
www.epscorvi.wordpress.com



## Outreach, Education, Diversity & Citizen Science

With a new team in place VI-EPSCoR's Outreach, Education, Diversity and Citizen Science Department is continuing to engage the USVI community in scientific and environmental issues.

Territory-wide, the Outreach Department works to highlight and de-mistify some of the cutting-edge research undertaken at the University of the Virgin Islands through initiatives such as *Science Cafés* which presents research in informal, accessible settings. *The Great VI Frog Count*, a citizen science project, is another example of community-targeted engagement.

The Outreach Department also partners to support education. The *Adopt-a-School* program works to strengthen existing STEM curriculum in participating schools. Other youth partners include 4-H and the VI Childrens Museum.

Research engaged through the UVI Center for Marine and Environmental Studies is transforming understanding of marine and terrestrial ecology. The Outreach Department is excited to continue sharing it with the Territory.

Joey DeMarco, *Acting Outreach & Education Coordinator*, brings to the team his experience working in education, professional development with the Smithsonian, and youth & community development in the Caribbean and West Africa.



First year graduate student Amelie Jensen collects carbon sediment cores from seagrass beds at Brewers Bay St. Thomas.

## VI-EPSCoR Welcomes New Staff

**Joey DeMarco,**  
*Acting Outreach & Education Coordinator*

**Serah James,**  
*Community Engagement Specialist*  
*St. Thomas / St. John District*

**Migdalia Roach,**  
*Community Engagement Specialist*  
*St. Croix*

**Elisa Bryan-Lacatena,**  
*Internet Communication Specialist*

**Resa Berkeley,**  
*Data Specialist*

**Melissa Williams,**  
*Administrative Assistant*

## VI STEM Teachers

Twelve VI STEM teachers affiliated with VI-ISERP presented their Collaborative Action Research at the 2016 International STEM Education Association (ISEA) Conference October 9-12 in Branson, Missouri

Along with UVI research director Dr. Celil Ekici, U.S. Virgin Islands STEM teachers were invited to lead four different demonstration sessions focused on their interdisciplinary project-based learning units at the conference. These projects were developed by interdisciplinary teams of mentor STEM teachers trained in the VI-ISERP Summer Institutes with yearlong learning support from local STEM educators, UVI Faculty, VI-EPSCoR researchers and community STEM experts and local community organizations.

This tremendous honor fuels the passion for education and learning as they moved into the 2016-2017 term.



Copyright VIISERP

## St. Croix Teachers

Along with VIISERP Research Director Dr. Celil Ekici, USVI STEM teachers from the St. Croix School District presented their projects with the STEM Institute at ISEA in Missouri, October 2016.