

VI-EPSCoR researchers involved an average of 79 individual collaborators each year of the grant.

The grant covered 2008 to 2014. It was the second major National Science Foundation grant awarded to VI-EPSCoR.

Visiting scientists significantly increased their use of UVI research facilities on St. Croix, St. John and St. Thomas.

VI-EPSCoR launched an oceanographic buoy that provides real-time ocean and weather data to mariners, fishers, boaters and scientists. Visit: caricoos.org.

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Grant Supported Cyber Infrastructure Improvements to UVI Campuses and VI-EPSCoR Researchers

VI-EPSCoR's 2008-2014 National Science Foundation grant provided critical funding for major improvements to the campus-wide cyber infrastructure at the University of the Virgin Islands.

Improvements completed not only allow local researchers to work better together via videoconference between islands, but with other scientists worldwide. The resulting collaborations strengthen the depth and quality of research efforts, while reducing its cost in terms of travel and time.



UVI students and faculty, along with members of the general community, take advantage of cutting-edge videoconferencing and high speed network connections made possible by NSF grant funds to VI-EPSCoR.

Making this possible were the completion of connections with the high-speed Internet2 network on the St. Croix and St. Thomas campuses, subsequent major upgrades to UVI's microwave system, and increased bandwidth and data transmission speeds. Security upgrades, and a backup system for UVI's vital microwave videoconferencing

system were also completed. Videoconferencing is also used extensively by instructors teaching classes remotely, as well as by faculty, staff and members of the public conducting meetings. Access is available at UVI locations on St. Croix, St. John and St. Thomas.

The establishment of infrastructure allowing for the collection of base Geographic Information Systems (GIS) data was completed in 2010. This included application, database and storage servers.

Development of the project data repository, environmental database and web portal were completed in subsequent years. An archival system for data storage and retrieval was also established and made available to support the work of VI-EPSCoR researchers.

Other Improvements...

- Implemented an enterprise-wide system allowing access to a networked server and to printers campus-wide.
- Moved UVI's University-wide email system to a cloud-computing model.
- Provided training to improve the ability of University staff to maintain the integrity and security of systems within UVI's wide-area network.

What is VI-EPSCoR? *Virgin Islands Experimental Program to Stimulate Competitive Research*

The Experimental Program to Stimulate Competitive Research – EPSCoR – is a program of the National Science Foundation (NSF) designed to increase research and education capacity in science and engineering within a state or Territory of the United States that has traditionally been under funded in these areas. The overarching idea is that individuals with training in the areas of science, math and technology are better able to have a positive impact on a region's management and development.

The U.S. Virgin Islands has been an EPSCoR jurisdiction since 2002. Virgin Islands-EPSCoR (VI-EPSCoR) is hosted by the University of the Virgin Islands on behalf of the people of the Virgin Islands. It receives guidance from a Governing Committee that includes representatives from both

the public and the private sector.

The NSF has designated 28 states, Puerto Rico, Guam and the Virgin Islands as EPSCoR jurisdictions. Each EPSCoR state designs and executes its own strategic plans by melding exemplary research, education and economic development initiatives into a statewide approach. The U.S. Virgin Islands received its first VI-EPSCoR grant in 2004, making it the smallest jurisdiction to have ever received such an award and UVI the only Historically Black University ever awarded.

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UVI researchers leveraged ICCE grant funding of \$12.4 million into 42 additional awards from other sources worth \$20.7 million.

Grant funds helped boost UVI's Internet connections and network speeds, allowing improved collaboration locally and worldwide.

VI-EPSCoR researchers produced 2 books, 17 book chapters, 94 peer-reviewed journal articles, 31 master's degree theses, and 222 presentations and posters.

Inside This Issue:

Collaborations	2
IEKHS Honored.....	2
Community Outreach...	3
GeoCAS	3
Cyber Infrastructure.....	4
About VI-EPSCoR.....	4



University of the Virgin Islands

Editor's Note: VI-EPSCoR received its third National Science Foundation (NSF) Research Infrastructure Improvement (RII) award in August of 2014. The \$20 million grant is now funding the five-year *Mare Nostrum Caribbean – Our Caribbean Sea* – project, which is designed to build upon the successes of the previous grant project funded by the NSF from 2008-2014. This newsletter provides an overview, review and some highlights of the 2008-2014 grant project.

Second Major NSF Grant Builds Territory's Research Capacity with Focus on Local, Regional and Global Issues

In the fall of 2008 the Virgin Islands Experimental Program to Stimulate Competitive Research (VI-EPSCoR) was awarded its second major grant for Research Infrastructure Improvement from the National Science Foundation (NSF). Over a total of six years – 2008-2014 – the grant, which was named the Integrated Caribbean Coastal Ecosystems (ICCE) Project – provided VI-EPSCoR \$12.4 million in funding.



NSF grant funds expanded opportunities for UVI's students, improved the Territory's ability to seek future funding and allowed increased outreach to the VI community.



Dr. Henry Smith addresses EPSCoR Conference in Washington, D.C.



Students join Coast Weeks beach cleanup.

Those funds were used to build the capacity for scientific research and education in the United States Virgin Islands. The effort specifically focused on issues of vital significance locally and regionally. It also contributed to global research on the impacts of climate change.

VI-EPSCoR's director at the time the grant was announced, the late Dr. Meri Whitaker, noted in a news release that the effort was supported by

key local officials then in office – V.I. Governor John deJongh, Jr., Delegate to Congress Donna Christensen and V.I. Senate President Usie Richards – as well as members of the VI-EPSCoR Governing Committee.

The NSF grant project included funding for initiatives throughout the Territory, as well as at the University of the Virgin Islands, which houses VI-EPSCoR. These were designed to help the Territory's young people become better prepared to enter the workforce or to pursue further education. They also served to directly strengthen the Territory's science and technical workforce.

VI-EPSCoR Director Dr. Henry Smith, who also served as the ICCE Project Principal Investigator, led the effort. The ICCE Project "allowed us the opportunity to build on what was started in the initial VI-EPSCoR project and to further establish UVI as a world leader in tropical marine research," Dr. Smith said. The University was able to attract "enthusiastic and highly qualified researchers to UVI and significantly improve our facilities and equipment holdings."

Dr. Richard Nemeth, a Research Professor of

Continued on page 2

EPA Honors High School Aquaponics Project Supported by VI-EPSCoR

In April of 2014, Ivanna Eudora Kean High School's (IEKHS) aquaponics project received an Environmental Quality Award from the U.S. Environmental Protection Agency (EPA) for achievements in "... creat(ing) a cleaner and healthier future for us all." This project was supported, in part, by VI-EPSCoR as one of the program's Adopt-A-School outreach and education activities.

VI-EPSCoR funding helped provide some equipment and supplies for the aquaponics program, including a refrigerator/freezer, chemical test kits, hatchlings, fish food and plant seeds. It also funded aquaponics training workshops in the community.



IEKHS Principal Dr. Sharon McCullum, left, Aquaponics Teacher Kirk Lewis, and EPA Regional Administrator Judith Enck at the award ceremony.

The EPA award cited the project for its promotion of healthy lifestyles and for "developing a positive awareness of the environment amongst the school's students and the wider community. It provides sustainable food without the use of pesticides or chemical fertilizers, as students and community members learn how to grow and harvest both fish and vegetables using innovative approaches."

This project came to national attention in 2013, and was featured by the U.S. Department of Agriculture in its Mid-Atlantic Region newsletter as "an excellent example of USDA's Farm to School Program."

The IEKHS project was also noted in First Lady Michelle Obama's "Let's Move" Blog – <http://letsmove.gov>.

ICCE Grant Funds Leveraged Into 42 Additional Awards, Individual and Institutional Collaborations Worldwide

Among the most significant contributions of the National Science Foundation's (NSF) 2008-2014 grant project – the Integrated Caribbean Coastal Ecosystems (ICCE) research program – was the extent to which it enabled the University of the Virgin Islands to leverage funds from other sources to support research and teaching programs within the University.

During the six years funding was received UVI researchers prepared and submitted 82 project proposals to various funding sources. These resulted in the receipt of 42 successful awards, which provided approximately \$20.7 million in additional funding.

An average of 79 persons collaborated with VI-EPSCoR researchers during each of the first five years of the grant. Over the full six years grant funds were received, a total of 244 individual collaborators were involved, resulting in the publication of a large number of multi-disciplinary, co-authored papers.

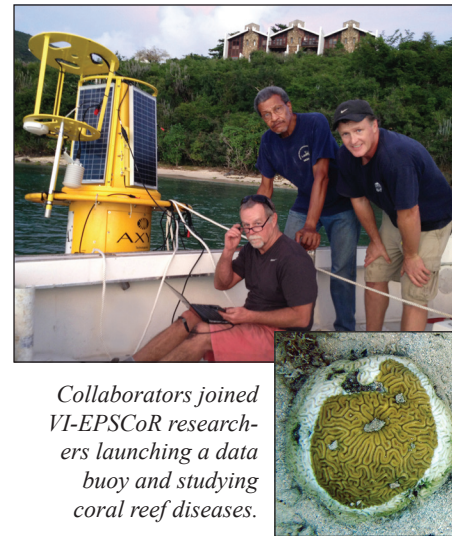
Collaborating scientists represented an average of 49 institutions per year during the first five years of the award, increasing to 120 institutions in the final year. Institutions included federal and local agencies

Second Major NSF Grant Builds VI Research Capacity - continued

Continued from page 1

Zoology and Marine Biology at UVI, who served as the project's Lead Scientist, said the investments in research infrastructure have elevated the quality and quantity of research that UVI is now capable of producing. "This research has already had an important influence on the management of the Territory's marine resources and is recognized internationally for its contribution to a greater understanding of coral reef ecosystems," Dr. Nemeth said.

Another key outcome was an increase in



Collaborators joined VI-EPSCoR researchers launching a data buoy and studying coral reef diseases.

and non-governmental organizations from the continental United States, Alaska and Hawaii, and the Territories of Guam and Puerto Rico.

Internationally, institutions participating were based in Australia, Bermuda, the British Virgin Islands, the United Kingdom, the Federated States of Micronesia, the Galapagos Islands, Hong Kong, Japan, Martinique, Mexico, Panama, Spain, Switzerland, Turkey and Venezuela.

the capacity of UVI to compete nationally for research grants. An external Monitoring and Evaluation Report noted that VI-EPSCoR, as part of the grant process, had "a very successful sixth 'bridge' year of their RII2 (Research Infrastructure Improvement grant #2) award, most notably by writing a successful RII3 proposal." That proposal resulted in VI-EPSCoR receiving the highest possible level of funding available from the NSF.

The report also pointed out the successful completion of all the planned research and cyber infrastructure renovations, along with most other upgrades.

The NSF evaluator also highlighted the involvement of UVI faculty, staff and students who it said were "very active in environmental, public service and educational programs and (in) explaining their research to the community at every opportunity."

Other Significant ICCE Results:

- Provided research infrastructure to support research and enhanced student learning outcomes at UVI.
- Generated new information on USVI coastal ecosystems.
- Increased the pool of Virgin Islanders with advanced degrees in science and mathematics.
- Expanded the science education experience of students in the USVI.
- Enhanced the skills of professionals in the community.
- Provided technical support to development initiatives coordinated by local and national agencies, non-profits and businesses.
- Increased understanding in the area of coastal ecological processes in the USVI.
- Increased understanding of USVI's human-natural coupled systems.
- Created greater influence in the public policy process as it relates to natural resources management.

Outreach Efforts Span the Territory

At its inception, VI-EPSCoR planners recognized the need to focus on local and regional issues and to involve the entire USVI community in the Integrated Caribbean Coastal Ecosystems (ICCE) Project.

From political and business leaders, to potential scientists in our schools and their parents, everyone has a vital stake in better understanding and ultimately protecting our endangered coastal ecosystems.

Marine and coastal research, along with expanding data collaborations, addressed concerns of local leaders. VI-EPSCoR also developed partnerships with groups such as the Virgin Islands Conservation Alliance, the Virgin Islands Network of Environmental Educators, Friends of the Virgin Islands National Park and the Virgin Islands Conservation Society.

Public outreach efforts touched many in the community, from an underwater film series on TV to a Lionfish Management Response Plan. Community events included: Annual Reef Fest Celebrations; Agricultural and Food Fairs; UVI's Afternoon on the Green; UVI's Research Day; St. Thomas-St. John Chamber of Commerce Business After

Hours; and the VI-EPSCoR Annual Conference.

Also, along with a public service TV spots, two general interest publications were promoted: "Hope Is Here," a children's book and classroom guide about a shorebird that migrated



annually from Canada to Great Pond on St. Croix; and "Waves of Change," a resource booklet about environmental issues in the U.S. Virgin Islands.

ICCE helped fund student travel to national and international science programs, support summer science programs and develop after-school tutorial programs. It also supported classroom and field exercises for students with internationally-renown scientists, and the VI-EPSCoR Adopt-A-School Initiative.

Graduates of UVI's Masters of Marine and Environmental Science program have been hired by UVI, local and federal agencies, and private sector firms.

The USVI's abundant natural resources provide UVI graduate students with unsurpassed access to study subjects.

UVI, with grant support, certified six students and researchers in Nitrox diving, and five in Advanced Nitrox and Decompression diving in 2013-2014.

Grant Supported GeoCAS Collaboration Locally, Nationally

UVI's Institute for Geo-Computational Analysis and Statistics (GeoCAS) opened in January of 2012 with financial support from the Integrated Caribbean Coastal Ecosystems (ICCE) Project. GeoCAS formalized the University's spatial analysis and statistics program, providing technical support to local and national organizations and agencies. The institute also provides a wide range of technical and teaching services to UVI.

GeoCAS collaborated with, or provided technical or consulting services to 10 organizations, in 17 distinct efforts. These ranged from providing data for tsunami modeling to the Virgin Islands Territorial Emergency Management Agency (VITEMA) to providing data exchange and hosting to the Nation-

al Oceanic and Atmospheric Administration (NOAA) Biogeography Branch.

Other organizations served included the Police Department, Housing Authority and Department of Planning and Natural Resources in the USVI, the NOAA Coral Reef Monitoring Program, Ocean Thermal Energy Corporation, and the Virgin Islands Developmental Disability Council.

GeoCAS also participated in fourteen community events, involving 680 participants. Subjects presented ranged from tsunami awareness to training in map and compass navigation, and data collection for marine spatial planning exercises.



GeoCAS printers provide resources for UVI student researchers and others.

UVI became a partner in NOAA's National Coral Reef Ecosystem Monitoring Program.