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Fall Research Symposium Showcases UVI's Student Scientists



[1] Almost 40 research projects conducted by University of the Virgin Islands science, technology, engineering and mathematics students were on display Sunday at the university's 17th annual Fall Student Research Symposium.

The symposium, which was held at UVI's Administration and Conference Center on St. Thomas, was organized by the Emerging Caribbean Scientists program in partnership with UVI's College of Science and Mathematics.

Student research on display was wide-ranging, tackling subjects from the evaluation of bat habitats to an analysis of cyber threats.

Marine sciences, however, ruled the day with almost half of all student presentations belonging to the fields of marine biology or oceanography. These included senior Richard LaPlace's analysis of photomosaics of coral reefs around Palmyra Atoll in the Pacific Ocean, and sophomore Calwyn Morton's inquiry into how a certain type of invasive species of sea grass, *Halophilia Stipulacea*, arrived in the Caribbean.

DeWein Pelle, a junior mathematic major, shared his continuation of ongoing UVI research into yellowfin grouper habitats along the Grammanik Bank, south of St. Thomas. Pelle brought his mathematician's eye to data collected by researchers in the marine biology department.

Pelle explained that the yellowfin grouper is one of the fish species found in the waters around the Virgin Islands that faces overfishing and potential extinction.

[2] Pelle used existing data collected by acoustic telemetry devices to identify deepwater areas where the grouper species likely spawns before migrating to shallower waters. To do this, he used complex mathematical functions to create graphic

charts that map areas along the Grammanik Bank, categorizing different locations from highly unlikely spawning areas to highly likely spawning areas.

These charts turned over 30,000 cells of data in a Microsoft Excel file into a more manageable and readable form.

Pelle said the results can be used to help improve the sustainability of the V.I. fishing industry and can be used in other types of animal population management.

“This method doesn’t have to be used just for fish. It can be used for any other species for that matter. And it can be manipulated and changed to fit different criteria,” he explained.



Another research project with implications for the fishing industry was conducted by senior marine biology student Austin Dubbs.

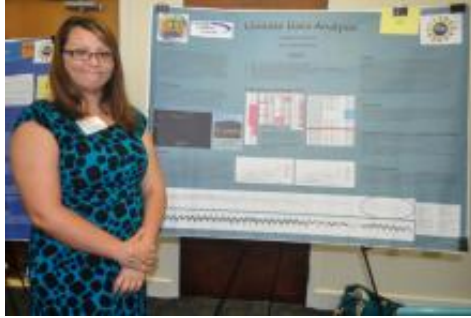
Dubbs said overfishing of several species of parrotfish has resulted in the overgrowth of algae on coral reefs around the territory, which can result in drastic changes to reef ecosystems.

Dubbs conducted research on St. Croix into the behavior of six different species of parrotfish to see if he could determine their individual effects on their habitats as algae control agents.

“We did 20-minute fish follows and recorded behavioral data. We wanted to find out what their bite rate was and what their food preference was,” he said.

Dubbs observed that while most of the parrotfish species ate turf algae, a harmless category of algae that are a common food source for fish, the yellowtail parrotfish actually targeted a particular type of algae known to be harmful to the reef.

This suggests to Dubbs that yellowtail parrotfish should be protected to ensure the health of reef ecosystems. He hopes to be able to conduct similar studies on parrotfish populations in Bermuda and Curacao, where differences in climate and approaches to preservation may further illuminate his findings.



[3] Candace Petersen, a sophomore majoring in applied mathematics, shared graphs she constructed that chart minimum and maximum temperatures across the Virgin Islands over a course of 41 years. She said she wanted to see if her graph would reveal any clearly identifiable patterns.

Petersen used data from the years 1972 through 2013 collected from 22 weather stations around St. Thomas, St. John and St. Croix. Her first step was to locate any outliers within the data to see historical weather events like storms or draughts would explain them.

“For instance, I thought 102 degrees was pretty weird of a temperature to find in November of 1998. When I researched further, I found out there was a hurricane that was passing by that may have caused this jump in temperature,” Petersen said.

Despite these outliers, as well as some significant gaps in the weather stations’ data, Petersen demonstrated that her graph showed a distinct and consistent rise in temperatures over the time period she studied. The gaps, she said, were mostly due to human or mechanical error in data-collection at the stations, and would not have changed the upward trend.

Now that she has charted temperatures, Petersen said she is looking forward to doing further research into precipitation using the same data.

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