UVI Research Day 2012

Poster and Roundtable Proceedings

April 14, 2012

St. Thomas:
UVI Sports & Fitness Center
(9am – 3pm)

St. Croix:
UVI Great Hall, Albert A. Sheen Campus
(9am – 12noon)

University of the Virgin Islands

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Office of the President

MESSAGE FROM THE PRESIDENT OF THE UNIVERSITY OF THE VIRGIN ISLANDS

In this Golden Jubilee year of the University of the Virgin Islands (UVI), it is truly a distinct pleasure for me to welcome each of you to the first of what I sincerely hope will be an annual event for UVI. It is truly fitting that, in keeping with the theme of our Golden Jubilee, *Honoring our Past – Creating our Future*, we are able to make this historic period in the life of the University with this UVI Research Day. As the only public institution of higher education in the territory UVI has a unique responsibility to provide educational programs that address the challenges and embrace the opportunities that impact the territory and the region. Today's UVI Research Day provides an opportunity for faculty, students and staff within the institution to showcase the research in which they have engaged, both recently and in the past, and to respond to issues and challenges that have impacted the Territory and wider Caribbean region over the past several decades.

To that end, this year's Research Day will provide participants with opportunities to interface with researchers and discuss research work at various stages. The research presentations will be done in two formats – Roundtables and Posters – and will represent research that is in progress, or that has been completed. Of particular note is the diversity of fields reflected through the research, specifically, Agricultural Sciences; Chemical and Physical Sciences; Computer and Computational Sciences; Education; Engineering Sciences; Marine and Environmental Sciences; and the Social and Behavioral Sciences. With such a variety, I am confident that all attendees will leave with a better understanding of the research being conducted at UVI.

As an inaugural event, I am delighted by the tremendous response from faculty, students and staff to the call for submissions of abstracts for this UVI Research Day. Indeed, as UVI matures and moves into its second 50 years, it is extremely critical that we solidify and expand the research pillar of this institution. Moving from a special University to a great University demands that we strengthen and expand our research efforts. Today, then, should serve as the springboard for *Creating our Future* relative to more fully incorporating research as an integral pillar of UVI.

I salute all the presenters and encourage each of you to continue your research endeavors. No university can be great without a strong research base. Your work will help move us on our path to greatness. To other participants, thank you for taking the time to experience this research showcase of the University. We look forward to being able to showcase the research of our faculty, staff, and students regularly. I would also like to take this opportunity to thank the organizers and all those who worked tirelessly to ensure the success of this very special event.

I am confident that the day will be both educational and inspirational.

David Hall

Dr. David Hall
President

No.2 John Brewers Bay • St. Thomas • U.S. Virgin Islands 00802 • Tel: (340) 693-1000 • Fax: (340) 693-1005

University of the Virgin Islands

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Office of the Provost

Congratulations on this first *UVI Research Day*!

Since arriving at UVI almost two years ago, I continue to be impressed by the nature and volume of research that the faculty, staff and students at this "small" university have conducted, are involved in, and are planning to implement. I know that what is presented during *Research Day* is only the tip of the iceberg, and it serves not only as a salute to the contributions that have been made in the past, but also to remind us all that there is a lot more to be done.

As Provost, I will continue to foster the impetus that has driven this "teaching" institution to continue to add to its accomplishments in research. I will further strive to build UVI's research capacity through expanding its research facilities and providing opportunities for all faculty, staff and students to play an increased role in scientific and social research. UVI has surely cultivated a rich research tradition in the relatively short 50 years of its existence!

Thanks to the efforts of all who have made this *UVI Research Day* possible. I look forward to this being an annual activity at UVI.

Best wishes!

Sincerely,

Karl S. Wright
Provost

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Greetings!

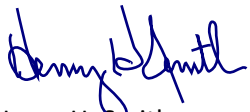
Research Day is an idea whose time has been long in coming and we owe our gratitude to Dr. Frank Mills and other members of the Research Day Committee for it becoming a reality. Their creative thinking and hard work have resulted in an event that allows the University of the Virgin Islands to highlight a very important aspect of its work that plays an important part in UVI fulfilling its mission to the USVI community.

The discovery and interpretation of new knowledge is critical to the advancement of all people. As the only institution of higher learning in the Territory, UVI has an unmatched concentration of personnel who are unquestionable well-qualified in a wide range of disciplines. The research presented at displays and the discussions that take place at the Research Day observances on the UVI campuses on St. Croix and St. Thomas, provide us with an opportunity to see some of the contributions these professionals and their students are making to addressing Territory-specific problems as well as issues whose impacts extend in many cases world-wide.

The value of Research Day is not only to highlight accomplishments and to provide information to the community on the capabilities of UVI staff and students, but also to create a forum for exchange of ideas and to be a source of encouragement and inspiration for current and prospective staff and students. Research Day then is a significant part of UVI's Golden Jubilee celebrations that could be a regular annual event at UVI. I hope that this will happen.

Congratulations and thanks to all for their contributions to and participation in this first Research Day. Let us use it for fostering reflection on accomplishments, for renewing our confidence in our university's capabilities and for confirming our responsibility and commitment to build on what we have for the betterment of the quality of life for the public that we all serve.

Sincerely,



Henry H. Smith
Vice Provost, RPS

Dear friends,

Thank you for visiting with us at the University of the Virgin Islands as we celebrate our Golden Jubilee with a special event, ***UVI Research Day***. Saturday, April 14th is a special day for UVI as we showcasing research by faculty, staff and students in areas as diverse as the physical, biological and health sciences, education and social sciences, as well as in animal and agricultural science.

This array of research topics is brought to you through poster presentations, round table discussions, research books/report displays and lively discourse. Much of this will is compiled in this inaugural publication with abstracts of our current research. Thank you for joining us as we seek to honor our past and create our future!

Sincerely,

Frank L. Mills, Chair
UVI Research Day Committee

Event Program

Saturday, April 14, 2012

ST. THOMAS

(UVI Sports & Fitness Center, 9:00am – 3:00pm)

a.	Poster presentations and display:	9:00 am – 3:00 pm
b.	Opening and keynote address:	11:00 am – 12:00 noon
c.	Roundtable discussions:	
	- Government – Non Profit partnerships (R3)	9:00 am – 9:50 am
	- Insight and Action for Student Success (R2)	10:00 am – 10:50 am
	- Virgin Islands and Crime (R6)	10:00 am – 10:50 am
	- Census 2010: Our declining population (R1)	12:00 noon – 12:50 pm
	- The lionfish invasion of the US Virgin Islands (R4)	1:00 pm – 1:50 pm
	- Health Disparities Research in the Virgin Islands (R5)	1:00 pm – 1:50 pm
	- Creating our Future I (R7)	2:00 pm – 2:50 pm

ST. CROIX

(UVI Great Hall, Albert A. Sheen Campus, 9:00 am – 12:00 pm)

d.	Poster presentations and display:	9:00 am – 12:00 noon
e.	Opening and keynote address:	9:00 am – 10:00 am
f.	Roundtable discussions:	
	- The Net Generation (R1)	10:00 am – 10:50 am
	- Hurricane Wind Tolerant Papaya Lines (R3)	10:00 am – 10:50 am
	- Floral Induction of Greenhouse grown Pineapple (R2)	11:00 am – 11:50 am
	- Creating our Future II (R4)	11:00 am – 11:50 am

Contents:

Indexes:

A. Poster Author Index

B. Roundtable Participant Index

C. Research Themes Index

Part 1:
Poster Abstracts
St. Thomas Campus

STT-P1

The Reef Is Closer Than You Think: an assessment of a multi-media campaign in the USVI

***Christine Settar*[1,2]**
[1]*UVI Center for Marine and Environmental Studies (CMES),*
[2]*Virgin Islands Marine Advisory Service (VIMAS)*

The goal of the multi-media community campaign, "The Reef Is Closer Than You Think", was to elevate U.S. Virgin Islands residents' environmental literacy and foster public action in coral reef conservation through outreach that targets motivations to care for reefs and communicates specific actions to increase reef protection. Outlets included television, radio, and cinema Public Service Announcements (PSAs), as well as mural painting & installation with local students, and installation of informative beach signs. Assessment focused on evaluating response from the general public via surveys delivered to residents 18 years or older. To maximize sample size, surveys were delivered as in-person interviews as well as online using www.surveymonkey.com, in English. Comparison of presence vs. absence of awareness of the campaign slogan was considered an indication of message reach and therefore general effectiveness in retention of the slogan itself ("The Reef Is Closer Than You Think"). To assess effectiveness of different media for message broadcasting, residents were asked to report where they had heard or seen the campaign slogan. Environmental literacy levels were summarized (What is a coral? What do they do in the environment?), as was presence of personal attribution for them (should you care about coral reefs?), and motivational drivers (why do you care?), to provide baseline information for further analysis of these and other outreach methods.192 surveys delivered Nov. 2010-May 2011 revealed that 61% of those surveyed had never heard the campaign slogan before. Of the 24% that had heard it, most (53%) identified non-PSA outreach efforts (i.e. word of mouth, printed materials, engagement activities) as contributing to their familiarity with the campaign. Television was the second most common source (38%), followed by radio (6%) and cinema (2%). Future analysis targeting different community groups with more focus on specific behaviors noted in the PSAs, beach signs, and murals may be necessary. For example, measuring change in sales of earth-friendly products, harmful chemicals, or in plastic bag use may indicate behavior change in Virgin Islanders, as a result of the campaign.

STT-P2

Caribbean hybrid *Acropora prolifera* viability restricted to shallow reef zones

Robert Brewer
UVI Master's in Marine and Environmental Studies, College of Science and Mathematics

The critically endangered Atlantic scleractinian corals *Acropora palmata* and *Acropora cervicornis* (Lamarck 1816) produce a fecund, backcrossing hybrid, *Acropora prolifera*, providing a genetic store for the genera as well as limited functional ecological redundancy. This study hypothesized that environmental and/or genetic factors may limit the typical spatial distribution of *A. prolifera* to extreme shallow water reef zones where *A. palmata* also typically occurs, as opposed to deeper reefs (>5m) where *A. cervicornis* is primarily found. At Flay Cay (US Virgin Islands), four visibly healthy *A. prolifera* colonies were fragmented, weighed (buoyant weight), and transplanted to 2-3 m (control), 10 m, and 22 m depths in different light

and current regimes for seven months to assess viability and growth characteristics relative to environmental characters via change in buoyant weight and a photographic time course. Genotyping determined four distinct genets. Frequency analysis showed depth significantly increased mortality (p=.004), disease incidence (p=.0026), and macroalgal interaction prevalence (p=0.0001). Depth (df=23, p=0.0001) and genet (p=0.0069) both effected fragment growth rates (Two-way ANOVA-no interaction, p=.0777); control depth mean growth was greater than both 10 m and 22 m (48%, 65% respectively) and three of four genets exhibited different mean growths. Scanning electron microscopy determined neither depth nor genet caused a difference in axial corallite outer diameter (df=11, p=0.1526, p=.3447 with no interaction) or a variation in number of axial concentric rings (all-3). The hybrid *A. prolifera* may be restricted to its shallow depth range by environmentally driven post-settlement factors that limit viability and typical growth at deeper depths.

STT-P3

Metagenomic Analysis of the Upper Respiratory Tract of Atlantic Bottlenose Dolphins with High and Low PCB Levels

Akima George[1,2], Nikole Kimes [2], Wesley Johnson[3], Marilyn Brandt[1] and Pamela Morris[2]
[1]University of the Virgin Islands; [2]Baruch Marine Field Laboratory, University of South Carolina, Georgetown, SC, USA; [3]Ecosystem Solutions, Inc., Edgewater, MD USA

Marine mammals are highly susceptible to upper respiratory diseases and respiratory illnesses are the main cause of mortality in wild and captive *Tursiops truncatus*, the bottlenose dolphin. Culture-dependent and independent studies of dolphin upper respiratory tracts (blowholes) have isolated potential pathogens that cause respiratory disease. Polychlorinated biphenyls (PCBs) have been shown to cause decreased immunity and increased susceptibility to infectious diseases in cetaceans. This suppression of immune function may play a role in respiratory diseases in dolphins. In this study, we characterized the metagenomes of the upper respiratory tract of common bottlenose dolphins from Sapelo Island, GA and Brunswick, GA using next generation sequencing. We hypothesized that the upper respiratory tracts from dolphins with high PCB body burdens would contain a higher proportion of viruses and potential pathogens. A total of 89,466,609 bp were analyzed from seven dolphin upper respiratory tracts, with each animal containing different levels of PCB exposure ranging from 40 to 769 ppm. The metagenomes were dominated by bacteria, with the Bacteroides, Proteobacteria, Actinobacteria, and Firmicutes as the most abundant phyla. A number of bacterial species associated with upper respiratory disease in humans were identified, including Staphylococcus spp. and Streptococcus spp. The viral sequences were dominated by bacteriophages, and were predominately classified as Adenoviridae and Mycroviridae. Human adenoviruses, which can cause upper respiratory disease in humans, and Tursiops truncatus papillomavirus (Ttpv), which is linked with genital papillomatosis in bottlenose dolphins, were also detected. In support of our hypothesis, dolphins with the highest levels of PCBs (769 ppm and 377 ppm) exhibited the highest percentage of viruses (approximately 10 %). The results of this work suggest that PCB levels in the animals may influence the microbial composition of the respiratory microbiome.

STT-P4

Education Research Grant: The Use of Creative Problem Solving as Curriculum Enhancement to Improve Cognitive, Behavioral, and Social Transformation in STEM Retention

Kimarie Engerman[1], Kostas Alexandridis[2,3], Donald Drost[3], Stavros Michailidis[4], Latisha Ramsey[1], Elena Kobrinski[2], Curlis Joseph[1], Darrell Mercer[1], Tara Brim[1]

[1]UVI College of Liberal Arts and Social Sciences; [2]UVI Center for Marine and Environmental Studies (CMES); [3]UVI College of Science and Mathematics, [4]Michailidis Ventures, LLC

Studies have shown that creative problem solving techniques have been effective in improving students' problem solving skills in educational settings (Torrance, 1972; Torrance & Presbury, 1984; and Parnes & Brunelle, 1967). Furthermore, Fox (2005) presented preliminary evidence that taking one creative problem solving class increased the likelihood that education students would graduate college by over 70%. For this reason, the overall aim of this project is to see how this increase in retention as a result of creative problem solving can be replicated in STEM fields. More importantly, the degree to which a high percentage of non-STEM students having an interest in pursuing a STEM career will also be examined. Finally, the project will expose how cognitive factors (career aspirations in STEM fields, and attitudes and beliefs about STEM), social factors, (peers, family, and institutional) and behavioral factors (selecting STEM as a major, and remaining in STEM) may be molded or is molded by the effectiveness of creativity training. The specific objectives of the project are as follows: (1) administer and assess the impact of creative problem solving on academic performance of students; (2) assess the degree to which cognitive, social, and behavioral factors impact or is impacted by the efficacy of creative problem solving; and (3) provide creative problem solving skills so students can continue to use the techniques after they leave *SCI 100*. Funding for this research is provided by NSF/HRD ERP award no. 1036183.

STT-P5

College Students' Attitude Towards Undocumented Immigration in U.S

Conisha Gumbs

University of the Virgin Islands Undergraduate Student

By studying the attitudes presented upon undocumented immigration, an unchanging problem in the U.S, we can comprehend where people stand on the issue. The study, "College Students' Attitude Towards Undocumented Immigration in U.S", was done to uncover if there is a significant difference in attitude towards undocumented immigration based on gender, status, and major of students. Using convenience sampling, 100 students (50 U.S and 50 international), completed a four point likert scale questionnaire comprised of 20 questions at various locations at the University of the Virgin Islands, St. Thomas campus. Using SPSS software, the Mann-Whitney test was used to compute the raw scores of gender and status demographics. The raw scores of major were computed by the Kruskal-Wallis test. All findings failed to reject the null hypothesis. Most students were tolerant of undocumented immigration. Missing data and the use of an indirectly affected sample to the issue contributed to the limitations of the study. Future study can be done in the community to target those directly affected. The USVI government and

other institutions can then use these finding to address the extensity of the problem in our community.

STT-P6

Reducing Stigma and Promoting Mental Health Awareness In The Virgin Islands

Angela J. Adams, Ferlicia Fergusson, Campbell Douglas, Angelina Prince, and Alina Matthew

Ashford University, University of the Virgin Islands

Mental health disparity plagues ethnic minorities in America and is expected to increase. African American and Caribbean people tend to underutilize mental health services partially due to stigma associated with mental illness. As a class project, students at the University of the Virgin Islands designed a study to assess the extent to which stigma and other barriers affected service seeking among residents of the Virgin Islands. This was the first step in a two-stage process to create a psycho-education program targeting mental health disparity in the Territory. Students distributed Mohr's Perceived Barriers to Psychological Treatment instrument to 125 adults. Results suggest that stigma and costs are significant barriers that influence service utilization. Age, mental illness history, and mental illness family history demonstrated insignificant associations with perceived barriers to seeking mental health services. Survey results form the basis for a proposed community education initiative that combines mental health services and informal support to increase service utilization and decrease disparity in mental health services.

STT-P7

Bridging the 10/90 Gap: Training Caribbean Researchers of Tomorrow

Angela J. Adams, Ferlicia Fergusson, Campbell Douglas, Angelina Prince and Alina Matthew

Ashford University; University of the Virgin Islands

The Caribbean is currently experiencing a shortage of mental health researchers. The students in the Master of Arts in Psychology program at the University of the Virgin Islands participated in a class project designed to promote student interest in research using faculty mentoring, positive reinforcement, realistic expectations, varied approaches, and practical application. This article provides an overview of the literature on research training, steps taken to engage UVI students in a research project, students reactions to the research experience, cultural variables that impacted the project, and insights gained from the experience. The conclusion provides a brief strategy for research education that incorporates cultural variables unique to the Caribbean region.

STT-P8

Heterosexual Attitudes towards Homosexuality

Syida Huggins-Richards
Social Science-Psychology Undergraduate student

In the world today, there are many views on a person's sexual preference. Societal attitudes towards same-sex relationships have varied over time and place. For much of the twentieth century, American psychiatry and psychology considered homosexuality as a form of mental illness. Today, acceptance of homosexual relationships and marriages has begun to gradually increase. However, homophobia continues to be prominent around the world. With the persistence of negative attitudes, stigmas and discrimination, the well-being of homosexuals is being negatively affected. For this study we asked (1) Does gender affect a person's attitudes towards homosexuality? (2) Does class rank affect a person's attitudes towards homosexuality? (3) Does academic major affect a person's attitude towards homosexuality? (4) Does church attendance affect a person's attitude towards homosexuality? Questionnaire data were collected at the beginning of Spring Semester 2012 to measure heterosexuals' attitudes toward homosexuality. Data were analyzed using logistic regression. This study serves as a significant endeavor in adding to the literature and promoting awareness of the various issues and challenges that surround the homosexual community such as sexual prejudice and discrimination, stigmas, stereotypes, and hate crimes.

STT-P9

Relationship between Peer Academic Support and Creative Problem Solving Skills

Kimarie Engerman[1], Kostas Alexandridis[2,3], Latisha Ramsey[4]
[1]UVI College of Liberal Arts and Social Sciences; [2]UVI Center for Marine and Environmental Studies (CMES); [3]UVI College of Science and Mathematics/Computational Sciences; [4]UVI Masters in Psychology Program

Retention of students in science, technology, engineering and mathematics (STEM) education programs has been identified as a problem nationwide. Studies have shown that social support is a key factor in retention. Additionally, creative problem solving techniques have been effective in improving students' problem solving skills in educational settings. Therefore, the objective of this study is to describe the relationship that exists between academic support received from peers and creative problem solving skills. Undergraduate students enrolled in Science 100 participated in the study. Science 100 is a mandatory course for all first year students enrolled in the university. Self-report questionnaire was used to collect data on perceived academic peer support. Academic peer support was measured in the form of four factors: (1) informational; (2) esteem; (3) motivational; and (4) venting support. The Torrance Test for Creative Problem Solving was used to assess creative problem solving skills. This paper will discuss the relationship between peer support and creative problem solving skills and how it could possibly affect retention. Funding for this award is provided by NSF/HRD ERP award no. 1036183.

STT-P10

Modeling relationships between coral bleaching and disease

Marilyn Brandt[1,3] and Robert Stolz[2]
[1]UVI Center for Marine and Environmental Studies (CMES); [2] UVI College of Science and Mathematics/Mathematics; [3]UVI College of Science and Mathematics/Biological Sciences

Coral disease and bleaching are two primary but independent causes of coral mortality in the Caribbean. In 2005, a mass bleaching event occurred in the northeastern Caribbean islands affecting US Virgin Islands reefs, and disease outbreaks that followed bleaching resulted in major declines in coral cover. Significant linkages between bleaching and disease were documented for the first time during this event and suggested that future mass bleaching events will likely result in more extensive disease outbreaks and coral loss. Results from the Virgin Islands Territorial Coral Reef Monitoring Program's data set on coral cover, bleaching prevalence and disease prevalence over the period 2002 – 2010, including during the 2005 event, were used to develop a mathematical model of bleaching and disease to better understand the dynamics of this event. Corals were modeled through four stages including healthy, bleached, diseased and dead. The exchange from healthy to bleached and bleached to diseased were dependent on rates derived from in situ data, and the 2005 pulse of bleaching was dependent upon degree heating weeks, a measure of accumulated thermal stress, which has been shown to be an ideal predictor of bleaching prevalence. Mass bleaching events are expected to become more frequent and intense as global temperatures increase and models like these will be important in predicting their impacts.

STT-P11

Studying Associations of Key Time Perspectives to Cognitive, Cultural, and Social Characteristics of College Student Performance: Early Evidence from a STEM Retention Study at the University of the Virgin Islands.

Kostas Alexandridis[1,4], Kimarie Engerman[2] and Davril Huggins[3]
[1]UVI Center for Marine and Environmental Studies (CMES); [2] UVI College of Liberal Arts and Social Sciences; [3]UVI Masters in Psychology Program; [4]UVI College of Science and Mathematics/Computational Sciences

The general purpose of this study is to examine the effects of Creative Problem Solving use on students in Science Technology Engineering and Mathematics subject areas. This study is being conducted on a sample of thirty nine (39) male and female undergraduate students at the University of the Virgin Islands attending Science 100, a mandatory course for sophomore UVI students, throughout two labs, one being a control group. We measured temporal perspectives of student's thinking using the Zimbardo's Time Perspective Inventory (ZTPI) and the Transcendental-Future Time Perspective (TFTP). In the combined scores, our study and control populations scored statistically significantly higher on their Past Negative, Present Fatalistic, and Transcendental Future dimensions, as compared to the reported national mean factor loadings, and in all three perspectives deviating further from the ideal scores (t scores of 3.84, 3.95 and 4.95 respectively; p<.001). We also found statistically significant gender and educational classification differences, as well as statistically significant differences across GPA performance

levels (using a GPA=2.5 as a cutpoint). In this paper we will discuss the significance of these findings with respect to key demographic, educational, cognitive, social, and cultural or sociocultural characteristics of our sampled population. We will argue that key temporal dispositional and social characteristics of student attitudes have strong associations with achieved academic performance and could conceivably affect future retention rates. Funding for this work is provided by NSF/HRD ERP award no. 1036183.

STT-P12

Is there a social preference of the rock boring sea urchin, *Echinometra lucunter*?

Tricia Greaux
Eastern Caribbean Center, undergraduate student

The rock boring sea urchin, *Echinometra lucunter*, has not been extensively studied and little is known about its social preferences. The survival of this intertidal herbivore is crucial in order to create a better environment for the survival of coral reefs. *Echinometra lucunter* eats algae which harms corals. Using a transect (3.5 m) and 6 quadrats (25 cm x 25 cm), a density analysis was conducted in the field to determine the natural occurrence of the *Echinometra lucunter*. The coefficient of variance was used to reveal aggregation. I observed these sea urchins push each other as a form of intraspecific competition. An experimental study was designed to determine the social preference by using a Y-maze choice experiment conducted at the William P. MacLean Marine Center, St. Thomas campus, University of the Virgin Islands. In the choice experiment, there was a group of juveniles in one arm of the Y-maze, with a single adult in the other arm (n=22). This was done to determine if, like other species of sea urchins, the juvenile *Echinometra lucunter* would aggregate with other juveniles. The other possibility is that adults protect the juveniles under their spine canopy. Therefore, the juvenile would travel towards the adult. A chi-squared test (independence) revealed there was no strong difference in the choice between both arms (p-value =0.088). This means the juvenile sea urchins did not respond differently to the cues from the groups; juveniles vs. single adult.

STT-P13

Coral Disease Prevalence of Coconut Island a Temporal Study Between 2007-08 and 2011

Stephan Bitterwolf[1]; Greta Aeby[2]; and Marilyn Brandt[3,4]
[1]UVI College of Science and Mathematics undergraduate student; [2]Hawaii Institute of Marine Biology; [3]UVI Center for Marine and Environmental Studies (CMES); [4]UVI College of Science and Mathematics/Biological Sciences

Coral reefs, while they cover less than .1% of the ocean surface area, harbor up to 25% of all marine fish species and have been estimated to be associated with 1-9 million species of organisms. This ecosystem provides humans services valued at approximately $US375 billion worldwide. Global warming, ocean acidification, over fishing, eutrophication, and coastal development threaten the health and prosperity of coral reefs. Synergism of these coral hazards has caused the loss of an estimated 27% of coral reefs in 2002. Since then multiple events have devastated coral diversity and cover in the Caribbean as well as many other coral hotspots and it is believed that coral disease outbreaks are increasing in number. The Pacific/Indo-Pacific when

compared to the Atlantic Ocean has fewer coral species affected by disease and greater species diversity. Hawaii, due to its geographically isolated location, exhibits low coral species diversity. Thus the coral ecosystem could be severely impacted by coral disease. In 2007-2008 Williams et al. (2010) conducted a disease abundance survey on the reefs of Coconut Island, Oahu, Hawaii. Since then the area has been subjected to many disease outbreaks including a recent outbreak of Montipora white syndrome, which led to the death of many *Montipora capitata* in 2010. In the summer of 2011, we conducted an identical abundance survey to that of Williams et al. under the assumption that coral community structure has changed in response to increased disease outbreaks. A total of 8 sites and 40 transects were surveyed for coral lesions including predation, Porites tissue loss, Montipora white syndrome, Porites and Montipora growth anomalies, Porites bleaching with tissue loss, and *Porites trematodiasis*. In all, 6291 coral colonies were observed in an 800 m2 area from July-August, 2011. Of these, 2654 (42%) had one of the above lesion types (961 predation, 53 bleaching, 10 bleaching with tissue loss, 140 Montipora white syndrome, 301 Porites growth anomaly, 120 Porites tissue loss, 1064 Porites trematodiasis, 5 Montipora growth anomaly). In this study, changes in coral species composition in relationship to disease prevalence are investigated using uni- and multivariate statistical tools. Due to the low coral species diversity in Hawaii, disease can have great implications for benthic composition/community structure, consequently affecting the productivity of the coral reef ecosystem. A change in this composition can mean a decrease in rugosity or habitat space necessary for other species' survival.

STT-P14

Experiential Social Learning for Coral Reef Resilience

Elena Kobrinski[1] and Kostas Alexandridis[2,3]

[1]UVI Masters of Marine and Environmental Studies; [2]UVI Center for Marine and Environmental Studies (CMES); [3]UVI College of Science and Mathematics/Computational Sciences

The purpose of this research is determine if there are any changes in attitudes, beliefs and behaviors from experiential social learning after visiting a coral reef, and how that learning experience relates to coral reef conservation efforts, increasing coral reef resilience. This study is expanding upon a similar project that is taking place at the University of the Virgin Islands (Alexandridis et al. 2010). While the study at the University involves the experiential participation of undergraduate students, this study expands on the same dimensions of the research into the local community, similarly evaluating participants that are embarking on snorkeling trips at ecotourism business establishments in the U.S. and British Virgin Islands. A number participants in ecotourism activities in the US Virgin Islands (St. Thomas, St. John and St. Croix), as well as the British Virgin Islands (Tortola, Virgin Gorda) were surveyed and ecotourism business establishment managers were interviewed. Our results show that experiential learning in marine and environmental ecotourism activities enhances participant conservation attitudes and dispositions at varying degrees. We found that socioeconomic and demographic factors influence the level of conservation-based attitudes, and that increasing opportunities for local participation in such activities promotes and fosters attitudinal and dispositional changes with respect to environmental conservation. We argue that social-ecological sustainability and resilience depends on the level of stewardship between

conservation-based ecotourism activities and local and/or regional perspectives in sustainable development. Funding for this research is provided by NSF VI-EPSCoR award no. 0814417.

STT-P15

The Role of Experiential Social Learning in Achieving Semantic Transformations in Community Attitudes, Beliefs and Behaviors Towards Coral Reef Resilience

Kostas Alexandridis[1,2], Kimarie Engerman[3], Teresa Turner[4], and Elena Kobrinski[5]

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The Virgin Islands near shore reefs have almost all been affected by anthropogenic processes including but not limited to coral bleaching, nutrient enrichment, sedimentation, and overfishing. The overall goal of the research undertaken is twofold: (1) to prove the conjecture that experiential social learning contributes to achieving semantic transformation in relation to community attitudes, beliefs and behaviors towards coral reefs and their conservation; (2) to enhance and promote scientific and methodological discovery related to the human and cognitive dimensions of environmental and natural resource sustainability and resilience. The research presents a mix of experimental and observational study with local participants. Participants were administered a pre- and post- attitudinal test, and during the experiment their interactions was recorded and observed in parallel by researchers. During the boat trip interactions three general research study activities were undertaken: (a) observing social group formation and dynamics including informal peer networks; (b) interviewing subjects in group/focus discussion settings, and; (c) observing informal interactions among individuals both in a discourse and in an underwater setting. The intellectual merit of the proposed research is advancing scientific knowledge and discovery related to (a) human dimensions in environmental, marine and natural resource conservation; (b) methodological underpinnings of human behavior and actions related to environmental change; (c) cultural and social community attitudes, beliefs and dispositions, and (d) insight into the complexity of social and collective interactions. Funding for this research is provided by NSF VI-ESPCoR award no. 0814417.

STT-P16

College Student's Time Perspectives and their Relationship to Academic Outcomes

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One of the most influential and silent force in one's life is the notion of time. Time has a profound way in guiding our actions, thoughts, and emotions. Phillip Zimbardo spent many years investigating the significance of time, and how it is perceived by many. For more than ten years of conducting research in the field of psychology of time, he has coined the idea of time perspectives. Zimbardo and colleagues noted that there are six most common time perspectives

in the western hemisphere. These perspectives include the past negative, past positive, present hedonistic, present fatalistic, future, and transcendental-future time perspective. The relevant literature support the proposition that one's time perspective is reflected in her/his attitudes, beliefs, and values. The research presented here aims to identify, quantify, and evaluate the time perspective distribution among the University of the Virgin Islands' students. The general goal is to investigate how cognitive and social perceptions, beliefs and student aspirations affect and being affected by their academic pursuits. Experimental sample data are collected from the UVI's Science 100 students in the St. Thomas Campus for the period 2010-2012. To access the study participants' construct of time researchers are administering the Zimbardo Time Perspective Inventory (ZTPI), and the Transcendental-Future Time Perspective Inventory (TFTPI). Academic pursuit goals are explored through studying student formal academic performance, educational plans and aspirations, retention rates, and broader social-economic factors. Preliminary results indicate the importance of time perspectives in social, cultural, and educational/academic interactions and vice versa. Furthermore, the relationship between time perspectives, socio-cultural and cognitive characteristics, reflects a complex system of associations with important implications for student academic outcomes and success. Funding for this research is provided by NSF/HRD ERP award no. 1036183.

STT-P17

Visualization and Aesthetic Perceptions in Assessing Caribbean Coral Reef Resilience: An Experimental Study

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Achieving sustainability and resilience in many of our contemporary global, regional and local ecosystems is of paramount importance. Natural (biophysical) and human (anthropogenic) factors, drivers and interactions are jointly responsible for a number of environmental challenges and transformations. Global and regional biophysical forces, such as climate change, sea-level and ocean temperature rise, changes in intensity and frequency distribution of extreme events, to name a few. Choices related to such global and regional transformations are either limited, or have not been part of a comprehensive national or regional approach. This research analyzes local Virgin Islander's perceptions regarding visual interpretations of coral reef systems in our region. Participants were asked to rank 25 images based on either their ecosystem health, or their subjective aesthetic preferences, randomly. The participant average and individual rankings were associated with demographic/personal characteristics, and the 25 images were submitted to unsupervised signal processing mathematical analysis and algorithms, including pattern recognition, threshold identification, RGB signal separation, entropy threshold, and others. Signal processing signatures and average values per image was then modeled against preferences and participant attributes. Our results indicate that: (a) biophysical systemic characteristics (color, patterns, thresholds, entropic characteristics) of visualization perceptions can be strongly associated with aesthetic preferences and attitudes, and vice versa; (b) visual aesthetic characteristics affect and being affected by age, gender, and education, and; (c) experiential

learning, i.e., learning by experience along with social learning affects both physical (aesthetic) and cognitive (perceptional) characteristics of participant's marine and environmental conservation priorities. Funding for this research is provided by NSF VI-EPSCoR award no. 0814417.

STT-P18

Is the Nassau grouper coming back in the US Virgin Islands? Assisting the recovery of an extirpated species through proactive management, scientific inquiry and fisher involvement.

Richard Nemeth
UVI Center for Marine and Environmental Studies (CMES)

The Nassau grouper, (Epinephelus striatus), once an abundant and common inhabitant on Caribbean coral reefs, has largely disappeared – or has it? This poster will examine the early days of Nassau grouper abundance in the 1960's through the catastrophic declines of the 1970's and 1980's. The collapse of Nassau grouper population was a direct result of fishing on their spawning aggregations, which used to form in December and January each year around the full moon. I will discuss the key management and conservation measures that were implemented (often too late) from the 1990's through 2000's and the science that has documented the past decline and recent potential recovery of this important species in the US Virgin Islands. Recent research has utilized underwater visual surveys, mark recapture studies, acoustic telemetry to track the movements of groupers around spawning sites and home reefs. Most importantly the presentation will highlight how research has helped to inform management and engaged the fishing community to bring back the Nassau.

STT-P19

Conservation and management of grouper spawning aggregation sites: adaptive strategies based on fish movement patterns.

Richard Nemeth
UVI Center for Marine and Environmental Studies (CMES)

Most large groupers (Serranidae) form annual spawning aggregations (FSA) at predictable times and locations; a life-history trait that makes them extremely vulnerable to over-fishing. Seasonal or permanent fishery area closures can provide effective protection, but defining biologically relevant boundaries is difficult due to limited knowledge of the movement and migration patterns associated with spawning. The aim of this study was to compare the spatial and temporal patterns of movement and migration of groupers at spawning aggregations in the Caribbean and Pacific. Surgically implanted acoustic transmitters were used to track the detailed movements of four species of grouper in the US Virgin Islands (Epinephelus striatus, E. guttatus, Mycteroperca venenosa, and M. tigris) and three species in Pohnpei, Micronesia (Epinephelus polyphekadion, E. fuscoguttatus and Plectropomus areolatus) using a large array of 40 acoustic receivers that were strategically placed around two FSA sites. Data indicate that distance travelled was positively related to fish length and that these species commonly swam 1 to 3 km in a few hours and could cover 15 km or more in a 24 hr period. Some differences in spatial patterns of

movement were detected between reef types in the Caribbean and Pacific but in most cases movements of tagged groupers carried them outside the existing protected area boundaries and exposed them to fishing mortality on a daily basis. Using the information from this study we can recommend general guidelines for establishing spatial requirements for each species around spawning aggregation sites that can greatly increase level of protection.

STT-P20

Distribution and Abundance of Hawksbill (*Eretmochelys imbricate*) and Green (*Chelonia mydas*) within Buck Island Reef National Monument, St. Croix, USVI

Clayton Pollock[1]. Paul Jobsis[2]
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Buck Island Reef National Monument (BIRNM) provides important habitat for "Critically Endangered" Hawksbill and "Threatened" Green sea turtles. This study assesses the distribution and abundance of sea turtles within a marine protected area. It also investigates potential relationships between the observed distribution and abundance of sea turtles and the benthic composition of certain areas within the park. As part of a renewed effort to collect in-water data from sea turtles at BIRNM this study will be the first in almost a decade to document sea turtle distribution and abundance. In this study the park was divided into 18 approximately 0.15 km^2 survey blocks and timed snorkel surveys were conducted along transects within each section to record the abundance, size class, disposition, and species of the sea turtles encountered. During approximately 32 survey effort hours we observed 36 turtles; 22 greens and 14 hawksbills. Using ArcGIS we then calculated an average percent cover for a variety of benthic habitat characteristics per section and used JMP and PRIMER software to investigate whether benthic communities were consistent between sections. Preliminary analysis using MDS, ANOVA, linear regressions, and likelihood ratios suggests that sea turtle distribution within the park is patchy and influenced by habitat. This study is part of the critical sea turtle monitoring at BIRNM, identifies salient sea turtle areas within the park and aids in assessing the recovery of these species.

STT-P21

Investigation of Doping in Graphene

Wayne Archibald
UVI College of Science and Mathematics

Graphene is comprised of a single layer of carbon atoms; it can be created by mechanical exfoliation of a single or a few layers of the material from bulk graphite, or grown by chemical vapor deposition through catalysis of methane on a metal substrate. This material has remarkable properties for both fundamental studies as well as potential applications in advanced electronic devices. Its mobility at room temperature, for example, is extraordinarily high (more than 10 times that of silicon) and is essentially unchanged by chemical doping. In a manner similar to that in semiconductors, the possibility to dope graphene either substitutionally or by using an organic route means is of particular interest for applications in electronic devices and chemical

sensors. Little is known about how to controllably dope graphene at this stage. Since many semiconductor devices depend on the ability to dope the material, it is important to understand how to carry out this process in graphene so that its potential for electronic devices can be fully explored.

STT-P22

Characteristics of aggregate spawning yellowtail parrotfish (*Sparisoma rubripinne*)

Ashley Ruffo
UVI Masters in Marine and Environmental Sciences (MMES)

The spatial distribution of marine fish populations depends greatly upon the habitat utilization of individual species. Few studies exist that examine the spatial-temporal reef utilization and foraging behaviors of group spawning resident reef fish. The first objective of this study is to evaluate connectivity between yellowtail parrotfish *(Sparisoma rubripinne*) spawning aggregation sites off the southern coast of St John, USVI. The second objective of this study is to compare foraging rates between inshore, shallow feeding areas and a deep, prominent reef spawning site through field observations. The third objective is to compare inshore fish abundance and benthic composition to that of the spawning site. This study will track aggregate individuals through acoustic telemetry and will allow for the determination of home ranges and movement patterns to and from aggregation sites. Fish abundance and benthic community surveys will be conducted at inshore depth gradients and will compared to This study will provide implications for the spatial management of essential reef habitat of an abundant herbivore and in addition will benefit other ecologically important resident reef species that assemble at spawning aggregation sites. Funding for this study was provided by a NOAA Cooperative agreement in collaboration with UVI for the study of spawning aggregate species. Additional funding was provided by the Lana Vento Charitable Trust.

STT-P23

Parent Satisfaction Surveys of Special Education Services in the USVI (2007-2009)

Frank Mills, Asha DeGannes and Ayishih Bellew
UVI Eastern Caribbean Center (ECC)

In 2007, the Eastern Caribbean Center (ECC) of the University of the Virgin Islands began the first data collection procedure to provide acceptable estimates of indices of parent satisfaction with the services provided to children with disabilities and their families by the State Office of Special Education (OSE). OSE provided a Likert-style survey instrument that inquired after parents' levels of satisfaction with the impact of services on their children's progress, with school personnel, individualized education program (IEP), parent involvement, and preschool education (to name a few). The data were collected via telephone interviews from parents of special education students. The Rasch rating scale method was used to transform the ordinal raw scores to interval-level data and the instrument was tested for the reliability and validity of the items. Item measures resulted in high reliabilities of 0.87 and 0.94 in 2007 and 2009, respectively. Parent measures and item calibrations confirmed the existence of a unidimensional construct of parent satisfaction. Good psychometric properties of the scales for the two time

periods enabled the direct comparison of the item calibrations and the parent satisfaction means for both years. In 2009, 32 percent of parents reported higher levels of satisfaction with the services than they did in 2007, and 58 percent remained at about an equivalent level. Overall, parents' mean satisfaction in 2009 was significantly higher than in 2007. The empirical evidence provided by this analysis enabled OSE to intervene directly into areas that were identified as requiring improvement.

STT-P24

Synthesis and Characterization of a Kläui Complex Containing $Na[Cp'Co\{PO(OC_2H_5)_2\}_3]$

Stanley L. Latesky[1], Surria James[1], Michelle Malone[1], Timothy L. Hubler[2] and Gregg J. Lumetta[2]

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The separation of actinide ions from complex chemical matrices is of importance in terms of radioanalytical chemistry and the management of radioactive waste materials. The work described herein is part of an ongoing study involving the synthesis and characterization of materials that can selectively extract and concentrate radioactive nuclides from complex mixtures. The Kläui salt, $Na[Cp'Co\{PO(OC_2H_5)_2\}_3]$ ($Cp' = C_5H_4C(O)OCH_3$), was synthesized. The route chosen to synthesize the ligand is similar to that used in the original reported synthesis. The crystal structure of $[(Cp')Co\{PO(OC_2H_5)_2\}_3]_2Co$ indicates that the ester functional group was reduced by excess diethylphosphite to a methyl group. Further studies will investigate oxidation of the cyclopentadienyl methyl groups to a carboxylic acid functionality, with the ultimate goal to covalently attach the functionalized Kläui ligand to a polymer support and to evaluate its potential to selectively bind actinide ions.

STT-P25

Application of Rasch Modeling to Human Sciences Phenomena

Frank L. Mills

UVI Eastern Caribbean Center (ECC)

Rigorous measurement in the human sciences is crucial to progress. Instructors of quantitative methods in these sciences, together with quantitative researchers, seem to focus narrowly on statistical analysis and do not demonstrate much concern about the quality of the measures to which these statistical tests are applied. The Rasch models for measurement present a new paradigm and are especially appropriate in the human sciences where Likert-style and other raw data are so vaguely conceived. While counts, scores, and ranks are the essential raw data for constructing measures, they are not measures in themselves because they do not have the numerical properties to support arithmetic operations. Arithmetic performed on numerical labels (that are often applied to questionnaire scale categories) cannot be logically defended, and when used with counts, raw scores and ranks, the results can be misleading. In order for arithmetic to be appropriately applied to statistical operations, this operation must be carried out with equal-interval, constant-unit, linear measures. Two areas in which parametric statistical tests ought not to be used are with ordinal data derived from Likert scales, and with percentages produced from

raw scores. Although ordinal ratings specify order, they are bereft of the numerical properties necessary to make them isomorphic to arithmetic. Thus any decisions derived from hypotheses based on ordinal data are doubtful, and probability statements are in error. Instructors routinely express n/N fractions as percentages for student scores. These percentages are to be regarded merely as orderings, and are insufficient to perform interval relations. Rasch modeling overcomes these common deficiencies in the use of ordinal rating-scale data and percentage scores as if they are measures. Only after the successful construction of interval linear measures that are reliable and valid is it justifiable to proceed with the comparison of measures over time periods, parametric statistical analysis of the comparison of means, regression, ANOVA, and the like.

STT-P26

Determination of the Equilibrium Constant of CMPO-HDEHP Systems

Marisha Perkins[1], Stella Jarvis[1], Stanley Latesky[1], Gregg Lumetta[2]
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With the concern surrounding the use and supply of fossil fuels, researchers and engineers have looked to other forms of energy to sustain the human race for years to come. The use of nuclear processes as a basis for the production of energy has been used for decades mainly because of its fuel availability for decades to come and the fact that it produces virtually no greenhouse gas emissions. Unfortunately, it has been under intense scrutiny since the start of the 21st century because nuclear processes produce high levels of nuclear waste, and there is currently no efficient way to process or store this waste. If fission-based nuclear fuel is to be produced as a widespread form of energy for decades to come, geological repositories for waste isotopes will not be sufficient for the mass of waste that would be produced. It is hoped that these radioisotopes might be used for other processes, thus limiting the amount of waste created. Various samples were prepared to be ran on NMR to confirm the equilibrium constant of the adduct or adducts that form between bis-(2-ethylhexyl)phosphoric acid (HDEHP) and octyl(phenyl)-N,N-diisobutyl carbamoylmethyl-phosphine oxide (CMPO), two ligands used extensively in the TRUEX and PUREX extraction processes.

STT-P27

F-Block Element Separations to Support Advanced Nuclear Fuel Cycles

Stanley L. Latesky[1], Emilio A. Edwards[1], Renesha V. Henderson[1] and Gregg J. Lumetta[2]
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Nuclear Fuel is a material that can be consumed by the means of fission or fusion to produce nuclear energy. Most nuclear fuels contain heavy fissile elements that undergo a nuclear fission chain reaction in a nuclear reactor. The actions of mining, refining, purifying and disposing of these elements together make up the nuclear fuel cycle. Separating americium (Am) and curium (Cm) from other fuel components, especially the lanthanides, remains a daunting challenge in nuclear fuel reprocessing. Separating these transuranic (TRU) elements from the other fuel

components would provide options for their destruction, lowering the long-term risks associated with nuclear power. The TALSPEAK process uses bis-(2-ethylhexyl) phosphoric acid dissolved in a diluent such as dodecane, to extract and separate trivalent lanthanides from the trivalent actinides (Am and Cm). To better understand the chemistry of the combined HDEHP/CMPO/dodecane extraction system, we performed spectroscopic (FTIR, UV-vis, and NMR) experiments to determine the species formed in the organic phase. The K values of the UV-Vis and IR HypSpec computations can both be used to evaluate data for the equilibrium constants for the formation of the Ln/HDEHP/CMPO complexes (Ln = La, Nd, or Eu). Further investigative study will use a higher field strength NMR to better analyze the solution chemistry of mixed Ln/ HDEHP and CMPO complexes at a higher resolution.

STT-P28

Trace Metal Analysis of Cistern Water in the USVI

Stanley L. Latesky and Stella P. Jarvis
UVI College of Science and Mathematics/Chemical and Physical Sciences

The quality of cistern waters in the US Virgin Islands has become a major concern. As an effort to address this issue, water samples were collected from a variety of cisterns on the islands of St. Thomas, St. John, and Water Island in order to perform organic and inorganic analysis. To date, a detailed analysis of the anionic species (halides, sulfate, nitrate, nitrite, fluoride, acetate, and phosphate) present was completed using a Metrohm 850 Professional Ion Chromatographic System. A comprehensive metal ion analysis (20 cations, list based on drinking water standards set forth by the US EPA) was completed using a Varian Inductively Coupled Plasma Mass Spectrometer (ICP-MS).

STT-P29

Virgin Islands Community Survey (2001-2009)

Frank L. Mills, Asha DeGannes, Ayishih Bellew, Corene Jn-Charles, and Sadio Thomas
UVI Eastern Caribbean Center (ECC)

Demographic surveys provide valuable data to policy makers, educators, the private sector, and to anyone needing population and housing data about their community. The Virgin Islands Community Survey (VICS) began in 2001 with the provision of population and housing estimates for the three islands of St Croix, St John and St Thomas. VICS is the only reliable source for population and housing estimates between Census years and it offers a wealth of other data, including poverty levels, unemployment data, immigrants' characteristics, rents and homeownership, computer and internet usage. What distinguishes VICS from other local surveys is that it is a multistage area sample of housing units (HUs), which means that each HU has a known probability of selection. This sampling process makes certain that the HUs are entirely representative of all sections of the VI population. An additional feature of this survey is that margins of error can be computed to indicate the level of accuracy of the estimates that are produced. VICS data are indispensable for the Kids Count Data Book. Hard copies of the annual data, and now in CD format, are distributed to all legislators, commissioners and directors, as well as to all libraries within the Territory.

STT-P30

Assessment of Youth Lifestyle Behaviors in VI Public Schools

F. Mills, A. DeGannes, A. Bellew, G. Fleming, S. Henry, M. Johnson, C. Jn-Charles, S. Thomas, T. Greaux, D Liburd
UVI Eastern Caribbean Center (ECC)

The set of moral values that prevail among students in our public junior and high schools are considered to be very different from those of 20 years ago. Without a clear understanding by adults of what motivate students in their often shocking behaviors, the Eastern Caribbean Center's research team set out to collect self-reported data via a survey instrument and to analyze them for substantive answers. The aims of the study are fourfold: first, to create an instrument to measure youth lifestyle based on several subscales: the nature of the school environment and physical safety, personal feelings and experiences with friends, self-perception in risky behavior, personal ethical and moral standards, participation in high-risk behavior, engagement in substance abuse, parental style and family relationship, and community safety. Second, create a new unidimensional interval level latent variable of youth lifestyle with the Rasch rating scale model. Third, investigate the psychometric properties of the new scale. Fourth, interpret the meaning of the new construct of youth lifestyle. A probability sample of 96 classes or clusters was selected from 447 classes by a stratified cluster design, yielding 1,931 student responses. The data were initially analyzed with Rasch rating scale software of the whole sample of 90 items, and then of the subscales separately. Analytic statistical tools include logistic regression for the prediction of selected behaviors, and multiple regression to tease out relationships among the regressors.

STT-P31

Data Mining Techniques and Applications: Sample Projects

Marc Boumedine
UVI College of Science and Mathematics/Computer and Computational Sciences

Data mining techniques are commonly to solve complex problems in science, business, academia and government that require analyzing large data sets. Often, complex decisions can be informed by exploring and discovering unknown and useful patterns. These patterns are usually extracted from large collection of data and sources. This presentation gives an overview of three studies performed by undergraduate students at the University of the Virgin Islands in three different data mining fields. The first project is an attempt to assess the impact of climate change on coral reefs and particularly on coral reef bleaching. Large amounts of in-situ oceanic and atmospheric data in the Caribbean region was collected and analyzed from NOAA Integrated Coral Observing Network (ICON/CREWS) stations. By mining this data, better determinations can be made as to what combination of complex factors (atmospheric and oceanographic) will likely result in coral bleaching and, thus, the monitoring of this critical resource. The second project consists in the classification of segments of *E. coli* DNA, known to be either promoter or non-promoter. Promoters are important, in the regulation of genes in determining which genes will be switch on or off at any given time. This project, addresses the problem of recognizing promoters using inductive machine learning classification techniques. The last project predicts the crime

per capita ratio based on analysis of socio-economic factors. The data sets were downloaded from the U.S. Census, the law enforcement data from the US LEMAS and crime data from the FBI UCR. Understanding of the complex relationship between socio-economic status and crime can inform governments and law enforcement to be able to improve community safety. The researchers have shown that it is possible to predict the crime per capita ratio based on analysis of socio-economic factors. Students are currently testing different algorithms to improve previous results. The increasing volume of data available on the cloud offers new research opportunities for students who are trained in this field. Students prepared to apply mathematical, statistical, and computational science techniques for recognizing patterns and building clustering and classification models are well placed for challenges ahead.

STT-P32

Threats to our Reef: Preliminary results on measurement of sediment production and particulate organic material in small subtropical watersheds on the East End of St. Croix, USVI

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Impacts on near-shore coastal habitats, resulting from sediment laden runoff, continues to be one of the main nonpoint sources of pollution contaminating surrounding waters in US Virgin Islands. Land use changes that decrease vegetation cover, increase the potential for soil erosion and therefore, sedimentation into coastal marine environments. Increased development, unpaved roads and a lack of effective erosion control practices have massively contributed to increased sediment loading rates in the territory. This study was designed to quantify and compare sediment production rates from natural and anthropogenic sources of sediment within the subtropical environment of the East End and Boiler Bay watersheds on St. Croix. Sediment production rates are being measured from undisturbed, vegetated hillslopes, and disturbed areas, represented by old unpaved roads that are currently used as foot trails. The main objectives of this project are: 1) to compare erosion rates between the two types of surfaces (i.e., trail vs hillslope); and 2) to quantify the particulate organic material composition of the collected sediment samples from both source types. Monitoring sites have been established throughout the watersheds by the installation of 21 sediment traps that collect material from trails, hillslopes and cliff surfaces. Material collected from each of the sediment traps during the 2010 study period were analyzed and correlated with rainfall data, slope and vegetation cover. Subsamples taken from the material collected from the sediment traps were analyzed for organic content, using the Loss on Ignition (LOI) method. Preliminary results illustrate that erosion rates on trail surfaces are higher than undisturbed hillslopes. In addition, the ranges of particulate organic material present in the soil samples are showing that samples taken from trail surfaces are generally lower than those taken from undisturbed hillslopes. This research was funded by the USGS through WRRI at UVI (Project Number: 2010VI170B) and by NSF HBCU-UP through ECS at UVI (Grant Number: HRD – 0506096).

STT-P33

Comparing the Microbial Communities of Black Band and White Plague Disease

Kurt Alexander
UVI Masters in Marine and Environmental Studies (MMES)

Coral disease is now considered one of the leading threats to coral reefs around the world and may have contributed to the greatest loss of coral cover in the Caribbean. Black band and white plague disease have shown devastating power in the Caribbean where they affect a large population of reef building corals. This study is novel in that it compares the communities of black band and white plague disease and attempts to trace the origin of these microbes by analyzing the microbial communities in the surrounding water column and sediments. Samples were collected from diseased and healthy coral tissue and from the water column and surrounding sediments. DNA was extracted from the samples using established protocol. The universal bacterial 16S rDNA primers and specific bacterial primers were used in polymerase chain reaction (PCR) analyses to amplify bacterial DNA within the samples. Thus far, the preliminary results show that there is indeed bacteria within all samples collected and that DNA has been extracted. Optimization of extraction and PCR protocol is still being conducted. Identification of specific bacterial species found in association with the coral diseases in this study will enhance research in other regions of the globe.

STT-P34

Dynamics of the evolution of reef corals: Repeated loss of coloniality and symbiosis

Sandra L. Romano
UVI College of Science and Mathematics/Biological Sciences

The dominance of corals on reefs in shallow, tropical waters is thought to be due in part to their combination of coloniality and symbiosis. Corals are also represented by solitary, asymbiotic species with a cosmopolitan distribution, occurring in shallow water to depths of 6,000m. It is generally thought that reef corals have evolved from solitary, asymbiotic nonreef species. To examine this hypothesis, a robust coral family tree was generated from analyses of DNA sequences from 80 species representing 18 (of the 24) families. This framework was used with Bayesian ancestral state reconstruction to test hypotheses about the evolution of coloniality and symbiosis. Analyses do not support traditional hypotheses, demonstrating that solitary corals have evolved from colonial ones and asymbiotic corals have evolved from symbiotic corals. The analyses also support a correlation between the evolution of coloniality and symbiosis. This means that ancestral corals originated and diversified in onshore environments and then colonized offshore habitats. Some lineages of reef corals may have escaped local extinction over geological time by diversifying into offshore environments. This link between reef and non-reef communities may have played an important role in the dynamics of extinction and recovery throughout the 240 my history of corals.

STT-P35

What is the trash problem for the STEER marine environment?

LeAnn Conlon, Alexis Sabine, Pedro Nieves, Sara Aubery, Scott Eanes, Brittney Honisch
UVI Masters in Marine and Environmental Studies (MMES)

The St. Thomas East End Reserve (STEER) on the southeast shore of St. Thomas comprises the Cas Cay/Mangrove Lagoon, and the St. James and Compass Point Marine Reserves and Wildlife Sancturaries that were established in 1994. A STEER management plan was developed through a collaborative planning process to protect the area as one comprehensive unit. Trash was identified as one of the high priority threats to STEER. Students in the UVI MMES Program are performing a quantitative assessment of the impact of trash within STEER in order to offer permanent, effective solutions to both managers and policy makers. The impact of trash on the marine hardbottom environment was determined by using a GIS sampling design to generate 183 random points for sampling sites. At each site the presence/absence and density of trash were measured along standard length transects. When trash was present, volumes by type of trash were estimated. Preliminary results suggest that refuse within STEER appears to gather in two high density areas: within Turpentine Run adjacent to the racetrack and along the east facing side of the Cays along Jersey Bay. The vast majority of the garbage found is associated with near shore activities and marine/boat activities.

STT-P36

What is the trash problem for the STEER mangrove shoreline?

Jane Conrad, Elizabeth Clemens, Nikita Thompson, Alex Webb, Tyler Grespin, Zach Whitener
UVI Masters in Marine and Environmental Studies (MMES)

The St. Thomas East End Reserve (STEER) on the southeast shore of St. Thomas comprises the Cas Cay/Mangrove Lagoon, and the St. James and Compass Point Marine Reserves and Wildlife Sancturaries that were established in 1994. A STEER management plan was developed through a collaborative planning process to protect the area as one comprehensive unit. Trash was identified as one of the high priority threats to STEER. Students in the UVI MMES Program are performing a quantitative assessment of the impact of trash within STEER in order to offer permanent, effective solutions to both managers and policy makers. The impact of trash on the mangrove shoreline was determined by using a GIS sampling design to generate 146 random points for sampling sites. At each site the presence/absence and density of trash were measured along standard length transects. When trash was present, volumes by type of trash were estimated. Preliminary results suggest that refuse within STEER appears to gather in two high density areas: within Turpentine Run adjacent to the racetrack and along the east facing side of the Cays along Jersey Bay. The vast majority of the garbage found is associated with near shore activities and marine/boat activities.

STT-P37

Larval settlement of the long-spined sea urchin, Diadema antillarum, corroborates seasonality and importance of post-settlement processes in the US Virgin Islands

Teresa Turner
UVI College of Science and Mathematics/Biological Sciences

Coral reefs have shifted to algal-dominated reefs throughout much of the Caribbean following the 1983 mass mortality of long-spined sea urchins, which suggests that herbivorous Diadema are important in maintaining coral-dominated reefs. Hence, urchin reestablishment could enable coral reef recovery, but Diadema populations remain variable and patchy. There could be (1) differences in larval supply between localities, (2) preferential settlement, and (3) mortality after settlement. To test larval supply between two sites with different adult densities, we deployed settlement collectors monthly in Brewer's Bay, St. Thomas. Data show a late spring/early summer seasonal peak in settlement. Additionally, we predicted that if larval supply accounts for the differences in adult numbers, the locality with higher adult density (Runway) would show significantly higher Diadema settlement. The results were that Black Point, the site with low adult density, had higher settlement, whereas Runway had low settlement. Thus, the larval supply hypothesis is falsified. Post-settlement mortality must affect juveniles, and further study on the behavior and nursery requirements of recently-settled juveniles could lend insight into survival mechanisms to ensure healthy adult populations. This research is funded by the NSF VI-EPSCoR grant # 0814417 and NSF HBCU-UP grant # HRD-0506096.

STT-P38

Participatory Community Perspectives of Environmental Sustainability and Social-Ecological Resilience in US Virgin Islands

Alex Webb[1] and Kostas Alexandridis[2,3]
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Due to an unprecedented human presence and influence on the earth's natural resources and processes the environmental sustainability and resilience of many areas is uncertain. This study will examine the collective perceptions of stakeholder and institutional groups, related to natural resource use, on the drivers that influence environmental sustainability and social resilience within the US Virgin Islands. The approach will use Social-Ecological Systems (SES) theory and involve a two-phase research methodology: (a) Participatory scenario planning to uncover the perceived drivers impacting sustainability and social-ecological resilience as well as examine the presence (or absence) and strength of a cohesive community vision regarding social-ecological stewardship, and (b) Game theoretic Role Playing Games (RPG) in which participants will engage in strategic collaborative decision making in exercises using scenarios identified during the participatory scenario planning phase. The benefits and broader impacts of this research are the identification, understanding, and in-depth analysis of real-world and place based emergent properties of an integrated social-ecological system of interactions; exploring and analyzing the multi-dimensionality of a diverse and integrated set of alternative collective social and mental perspectives; and, the provision of an evidence-based decision support mechanism to aid

resource managers, end users and the broad community in the USVI and the Caribbean region. Funding for this research is provided by NSF VI-EPSCoR award no. 0814417.

STT-P39

Intraspecific protection provided by sea anemone mucus may aid in symbiont fidelity

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Several species of shrimp may live symbiotically within the stinging tentacles of the sea anemones *Condylactis gigantea* and *Barthalomea annulata*. There is evidence that some species of symbionts may have innate protection from the nematocysts (stinging cells) of the anemones, and that some symbionts use mucus from the anemone to protect themselves from the stinging cells. At least one species of shrimp, *Periclimenes yucatanicus* may be found on either species of sea anemone in the wild. To test the hypothesis that mucus from the sea anemone provides protection from the nematocysts of anemones intra-specifically but not inter-specifically, we introduced 5mM proline 5% agar strips either with or without mucus to multiple anemones. The tentacles of the anemones attached to the uncoated strips 95% of the time (n=20). C. gigantea attached to agar strips coated with C. gigantea mucus only 20% of the time (n=40). B. annulata anemones attached to the agar strips equally, independent of the application of C. gigantea mucus (92.5%, n=40). This suggests that components of the mucus that provide protection are species specific and create a mechanism for species fidelity within anemone symbionts.

STT-P40

Pilot Study Shows Success in Relocation of Leatherback Sea Turtle (*Dermochelys Coriacea*) Nests above the Backshore Beach at SPNWR

Paul Jobsis, Clayton Pollock and Claudia Lombard
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Through conservation, strict enforcement, and the hard work of many dedicated managers and volunteers the number of Leatherback sea turtles nesting at Sandy Point National Wildlife Reserve has increased over the past 30 years. Starting with 20 nesting turtles in 1981 the nesting population has increased dramatically with 208 turtles nesting in 2009. Dynamic erosion patterns coupled with increasing nesting densities may require innovative strategies to maintain this increasing population. Sea level rise and global climate change could also severely limit available nesting and relocation areas further acerbating management. Expanding relocation areas to include the backshore beach within the seaward vegetation would greatly increase the area available for the relocation of imperiled leatherback nests. However, previous studies have shown that relocation into vegetated areas decreases hatch success significantly due to root invasion and hatchling entrapment. Tilling these sandy areas may mitigate these and other soil conditions detrimental to hatch success and have the added benefit of easing the management, oversight and protection of these nests. In a pilot study we tested the effect of tilling the relocation area (1m x 1m x 1m per nest) to remove roots, rocks and other large debris. We compared the hatch success of tilled experimental plots to both natural in situ nests and standard protocol relocated nests on the open (non-vegetated) portions of the beach. In situ nests had a

hatch success of 45.4 % ± 5.8 se, n=8; relocated nests using the standard protocol had a hatch success of 52.1 ± 7.9 se, n=8; nests relocated into tilled plots had a hatch success of 52.0% ± 4.2, n=9. None of the nest types showed any statistically significant difference in hatch success. Temperature profiles of the nests in the tilled plots showed a normal temperature profile throughout the nesting period and did not exceed 35 °C. These results support a larger trial of relocation into tilled areas. If future data continues to support these conclusions, then utilizing the backshore beach areas would greatly increase the area suitable for relocation and improve the management oversight and protection of these nests.

STT-P41

Nutrient Transfer from Leatherback (*Dermochelys Coriacea*) Nesting Activities at Sandy Point National Wildlife Refuge

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Sea turtle nesting represents a potential transfer of nutrients from the marine to the terrestrial environment. This transfer can affect the distribution and growth of plants inhabiting sea turtle nesting beaches and subsequently affect the hatch success of nesting beaches. In this pilot study imperiled leatherback sea turtle clutches were relocated to tilled plots located within the sprawling seaward vegetation community dominated by Ipomea sp. and to traditional relocation sites utilized by resource managers at Sandy Point National Wildlife Refuge. Soil parameters within relocated and in situ nests were measured at deposition, excavation and post-excavation (D, E, P-E; P-E occurred approximately 30 days following excavation) to determine changes in soil composition important to plant growth including estimated nitrogen release (ENR), available phosphorous, percent organics and soil pH. ENR values were 53.6±2.2, 58.4±5.9, 63.4±3.8 (D,E,P-E, lbs/acre, n=27); phosphorous values were 1.1±0.3, 21.5±40.2, 5.6±5.6 (D,E,P-E, ppm, n=24); percent organics values were 0.53±0.09, 0.74±0.27, 0.97±0.19 (D,E,P-E, percentage, n=27), soil pH values were 9.39±0.08, 9.02±0.41, 9.08±0.30 (D,E,P-E, n=27). Repeated measures ANOVA analysis was used to determine significant changes all reported in soil parameters. Nest type, in situ, traditional relocation, tilled plot relocation, did not appear to affect the nutrient deposition. However the decomposition was not complete even at post-excavation therefore these values are certainly an under estimation of the nutrients delivered to the beach by the turtles. This investigation is relevant to resource managers attempting to understand the effects of nutrient transport associated with sea turtle nesting that may enhance plant growth. For sea turtle nesting beaches encroaching vegetation can compound negative factors such as dynamic erosion patterns and sea-level rise. The placement of relocated nests and the ability to exert more control over the relocation process may become increasingly more important as global climate change will likely alter the environmental parameters of nesting beaches.

STT-P42

Ciguatera Fish Poisoning: Effects of depth, grazing and nutrient enrichment on the abundance and distribution of *Gambierdiscus* spp.

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Gambierdiscus spp. are benthic marine dinoflagellates that produce a suite of toxins responsible for the occurrence of Ciguatera Fish Poisoning (CFP). In ciguatera endemic areas, this syndrome significantly impacts human health and local economies. Efforts to prevent CFP have been slow due to the lack of rapid screening methods for ciguatoxin. Using standardized methodologies, this study investigated how grazing, nutrient enrichment, wave energy, and depth (light attenuation) influence the abundance and distribution of *Gambierdiscus* spp. in St. Thomas, USVI. Sampling took place on the southwest side of St. Thomas at three locations, each with adjacent reefs at depths of 10 and 20 m, for a total of six sampling sites. The paired sites at each location were oriented in an onshore to offshore gradient to examine differences in depth and wave energy. Artificial settlement surfaces (rock tiles) were deployed at each site, and subjected to several different treatments: full caging (to exclude grazers), full caging with nutrient enrichment, partial caging, partial caging with nutrient enrichment, and no caging/nutrient enrichment (control). Results indicated there was a five-fold increase in the abundance of Gambierediscus spp. on tiles projected from grazing ($p=0.015$), but no effect of nutrients or depth. The results of this study will help characterize potential controls on Gambierdiscus populations, and may lead to new insights regarding the potential impact of overfishing and eutrophication on *Gambierdiscus* spp. dynamics.

STT-P43

The US Virgin Islands Territorial Coral Reef Monitoring Program: A Nexus for Reef Research

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The Territorial Coral Reef Monitoring Program (TCRMP) housed at the Center for Marine and Environmental Studies (UVI) is a central component of coral reef management and research in the USVI. Our vision for the program is to provide critical information on the status and threats to all VI coral reef ecosystems in order to increase management effectiveness and improve basic and applied coral reef research. The program consists of annual to semi-annual assessments of coral health, benthic community structure, fish community structure, and physical dynamics at 33 sites down to 65 m (220 ft) depth. The TCMRP has contributed critical information on land-based sources of pollution, fisheries status, and coral reef bleaching, and since its inception in 2001. (1) Fish census data between 2003 and 2009 showed that many species that were relatively common on St. Thomas-St. John reefs were in low abundance on St. Croix reefs. Analysis showed that this was not an effect of habitat, but likely different fishery pressure, which was approximately four-fold greater per area on St. Croix. (2) Land-Based Sources of Pollution increase dramatically from offshore to nearshore waters of the USVI. Fine particles in terrestrial

sediments have strong negative effects on economically important stony corals. However, there is high variability in sediment effects within and between bays and cleaner bays offer guidance for best management practices. (3) Shallow water corals bleached extensively during the 2005 warm water event, and suffered unprecedented levels of disease and mortality. Responses were species-specific, with susceptible, resistant, and resilient Caribbean taxa identified. Mesophotic corals (>30m depth) bleached less, but had high disease and mortality, pointing to susceptibility in a potential refuge. The data available from the TCRMP can be used to help inform future scientific research and is a long-term asset to the U.S. Virgin Islands and the region.

STT-P44

Defense in the Caribbean

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Defense in the Anglophone Caribbean in contemporary time has its antecedent in the insertion of the British military in what was then referred to as the West Indies in the 17th century. This pattern took the form of garrisons, the militias, and even fortifications. The first regional attempt at defense was the establishment of the West India Regiment in 1959 that was part of the West Indies Federation whose military arm was stationed in Jamaica. However, since the demise of the Federation in 1962 and acting on the nationalist impulse, Anglophone Caribbean states have opted for national defense forces. These forces as a whole have been small, not well funded and dependent on foreign assistance for their training, development and survival on the U.S. Britain, Canada and to a lesser extent China. At the outset, most of the regular military or defense forces of the Anglophone Caribbean were ostensibly established for defense. However, this emphasis has been downgraded if not dropped in favor of an emphasis on internal security at the local level or in a neighboring Caribbean territory as well as for relief operations, particularly hurricanes. In so doing, these "client security forces" among the Anglophone Caribbean serve as a bulwark of the status quo and as a protector of US political and economic interests in the sub-region.

STT-P45

Enhanced Penalties for Youth Related Crime in the Virgin Islands

William A. Curtis, Jr.
UVI College of Liberal Arts and Social Sciences (CLASS)

Over the past 15 years, loosely organized neighborhood youth posses/cliques within the Virgin Islands have grown into organized youth gangs involved in home invasions, burglaries, vehicle theft, drug trafficking and drug sales, and murder. The resulting gang violence has overwhelmed the citizens and visitors of the Virgin Islands, and has had a traumatic effect on the territory's tourist base economy. It is understandable that there are a number of youth who come from dysfuntional families, who are drawn towards gangs, as a means of mere survival. However, there are those youths who come from functional and well organized families, who are also drawn towards gang membership. Therefore, the questions to this conundrum are: (1) why are our youth, from various backgrounds, drawn towards gang membership, (2) how are they so

overwhelmingly indoctrinated into gang culture, and (3) how can we deter youth from gang membership, and counteract its cultural effects. Presently there is legislation being proposed within the 29th Legislature of the United State Virgin Islands that would seek to increase the penalty of incarceration for youths convicted of crimes under the auspusiss of gang activity. Research has shown enhanced penalties alone do not deter gang violence. Therefore the author seeks to conduct a study that will examine the effect enhanced penalities for gang related crime will have on membership, crime rate, and the recidivism rate of these youth gang members within the Virgin Islands.

STT-P46

Incarcerated Women in the Virgin Islands: Factors that Influence Women to Engage in Crime

Chanelle Kuntz
UVI College of Liberal Arts and Social Sciences (CLASS) Undergraduate Student

Women face challenges every day. Some have very minimal education, which means that they occupy low paying jobs. Some grew up in single-parent homes with only one parent working tirelessly to supply the family's needs. Now they are single parents themselves, struggling to make ends meet. Additionally, some of them have been victims of serious crimes. What if a single woman experiences all of these problems at the same time? How do you think she will react? Research has shown that these are some of the factors that influence women to commit crimes. The goals of this study are to: identify the factors that lead women to engage in criminal activities, understand why these factors may play a role in criminal behavior, and seek out innovative solutions to these problems. The researcher will conduct interviews with incarcerated women on St. Croix and St. Thomas Virgin Islands. With this knowledge we can consider ways to reduce the risk of women engaging in criminal activities, which leads to their incarceration.

STT-P47

Comparison of Angle Resolved Photoemission and Scanning Tunneling Microscopy on High Tc superconductors using the YRZ Model

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The goal of this study is to use the Yang-Rice-Zhang (YRZ) to model the behavior of electrons in a sample of Bi2Sr2CaCu2O8 for the pseudo gapped, and superconducting state. Two experimental techniques are known to perform such a task and they are in some disagreement. Angle resolved photoemission spectroscopy (ARPES), a direct measurement, and Scanning tunneling Microscopy (STM), which provides similar information, and determines electron behavior after some considerable data processing; appear to show somewhat different behaviors for high temperature cuprate superconductors. While the YRZ model appears to work for photoemission, it must now be tested against the STM data. The main thrust of this project is to determine the energy range the model agrees with the STM data, if at all. In order to accomplish this, constant energy contour images were first created. The Gwidyon software was then used to create autocorrelation images to determine the quasipaticle interference (QPI) patterns. The QPI

image and crystal symmetry were then used to determine the q-vectors of the octet model. This calculation was scripted in MATLAB and ran to calculate the dimensions of the q-vectors for Binding energies between -105 meV and 105 meV. The q vectors connected points of high density of states in the constant energy surfaces, reflected by bright spots in the autocorrelation images. One of the major findings includes the fact that the graphs are not symmetric in binding energy, as was previously believed.

STT-P48

Mental Health Outcomes of Partner Abuse in African Caribbean and African American Women

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This study examined associations between partner abuse status and mental health outcomes in African Caribbean and African American women in the USVI and Baltimore. Studies of Caribbean women of African descent are limited. No studies were found that examined associations between partner abuse and mental health outcomes in abused women in the USVI. This is a case control study of partner abuse. Participants were 847 women self-identified as African Caribbean, or African American aged 18-55, and reported having an intimate partner during the past two years. Cases (n =545) of intimate partner abuse (IPA) reported physical, sexual and/ or emotional abuse. Controls (n = (361) were never-abused women. Participants completed a survey using audio computer-assisted self-interview. Logistic regression was used for data analysis. On bivariate analysis being abused significantly increases risk of depression (CESD10), Post-traumatic Stress Disorder (PCPTSD, and decreased overall mental health. Controlling for age, income, education, site, employment, marital status, and children under 18, subjects in the case group, relative to the control group (not abused), had 3.77 (Wald Confidence Limits 2.817-5.046) higher odds of experiencing PTSD. Risk of significant mental health outcomes for abused women is substantial. Health care providers need to be diligent in screening for partner abuse and be alert for potential adverse mental health outcomes in women who screen positive.

STT-P49

Health education Toolkit as a Resource for Communicating Health Information in the US Virgin Islands

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The Caribbean Exploratory Research Center (CERC) was established at the University of the Virgin Islands, School of Nursing in 2007. One component of the CERC is the Community Engagement and Outreach Core (CEOC) and through this Core, the CERC is working to decrease health disparities in the U. S. Virgin Islands through health education and community outreach. One of the projects of the CEOC was the creation of a culturally tailored health

education toolkit for dissemination throughout the U. S. Virgin Islands community, including the islands of St. Croix, St. Thomas and St. John. The CEOC engaged community residents and health professionals of St. Croix and St. Thomas to give feedback on the toolkit to ensure it was relevant and feasible. CEOC members then made changes to the toolkit based on that feedback. The health education toolkit is in its final stages of preparation with wide spread distribution planned, including dissemination to health and human services organizations, faith-based community, and lay educators for use with their specific populations served and integration into their existing programs. A modified version of the toolkit will also be distributed to the lay community during fairs and other major community functions.

STT-P50

Intimate Partner Violence, Depression, PTSD and Use of Mental Health Resources among African American and African Caribbean Women

Jamila K. Stockman[1], Marguerite B. Lucea[2], Jessica R. Draughton[2], Bushra Sabri[2], Jocelyn C. Anderson[2], Desiree Bertnard[3], Doris W. Campbell[3], Jacquelyn C. Campbell[2], Gloria B. Calwood[3]

[1]Unicersity of Califormia, San Diego; [2]Johns Hopkins University School of Nursing; [3]UVI Caribbean Exploratory Research Center

This study examined exposure to violence and risk for lethality in intimate partner relationships as factors related to co-occurring PTSD and depression problems and use of mental health resources among African-American and African-Caribbean women. Data for this cross-sectional study was derived from a large case-control research project examining the relationship between abuse status and health consequences among African-American and African-Caribbean women. Women with intimate partner violence experiences (n=422) were recruited from primary care, prenatal or family planning clinics in Baltimore, MD and the US Virgin Islands. Multivariate logistic regressions were used to determine associations between severity of intimate partner violence, risk for lethality, use of mental health resources, and co-occurring PTSD and depression problems. While risk for lethality was significantly associated with co-occurring PTSD and depression problems in bivariate analysis, it was not the case in multivariate analysis. Severity of physical and psychological abuse, however, was related to co-occurring PTSD and depression problems, in both bivariate and multivariate analyses. Women with co-occurring PTSD and depression problems were significantly more likely to use mental health resources. Conclusions: The findings suggest that severe intimate partner violence experiences are risk factors for co-occurring PTSD and depression problems, which in turn, increases the need for mental health services. Thus, clinicians in health care settings must thoroughly assess women for their intimate partner violence experiences and develop tailored treatment plans that address their abuse histories and mental health needs.

STT-P51

Exposure to Violence and Co-occurring Mental Health Problems among African American and African Caribbean Women

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[1]*UVI Caribbean Exploratory Research Center;* [2]*Johns Hopkins University School of Nursing;*

This study examined exposure to violence and risk for lethality in intimate partner relationships as factors related to co-occurring PTSD and depression problems and use of mental health coping resources among African American and African Caribbean women. Data for this cross-sectional study is derived from a large case-control research project examining the relationship between abuse status and health consequences among African American and African Caribbean women. 422 women with intimate partner violence experiences were recruited from primary care, prenatal or family planning clinics in Baltimore and US Virgin Islands. Multivariate logistic regressions were used to determine the associations between severity of intimate partner violence, risk for lethality, use of mental health coping resources, and co-occurring PTSD and depression problems. Severity of physical and psychological abuse was related to co-occurring PTSD and depression problems. Women with co-occurring PTSD and depression problems were significantly more likely to use mental health resources. The findings suggest that severe intimate partner violence experiences are risk factors for co-occurring PTSD and depression problems, which in turn, increases the need for mental health services. Thus, clinicians in health care settings must thoroughly assess women for their IPV experiences and develop tailored treatment plans that address their abuse histories and mental health needs.

STT-P52

Intimate partner violence, HIV risk, and condom use and negotiation among African American and African Caribbean women in clinic-based settings

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Despite progress against intimate partner violence (IPV) and HIV/AIDS in the past two decades, both epidemics remain major public health problems in the U.S. and in the Caribbean, particularly among women of color. The objective of this study was to assess the association between recent IPV and sexual and drug risk behaviors, STIs, and condom use and negotiation among women of African descent recruited from women's health clinics in Baltimore City, Maryland and St. Thomas and St. Croix, U.S. Virgin Islands (USVI). Women were eligible to participate in this multi-site comparative case-control study if they were aged 18-44 years and had a current intimate partner. For the current analysis, women who experienced physical and/or sexual IPV in the past two years (Baltimore, n=107; USVI, n=235) were compared to women who never experienced any form of abuse (n=Baltimore, n=207; USVI, n=119). Logistic

regression identified correlates of recent IPV by site. In both sites, partnership concurrency was independently associated with a history of recent IPV (Baltimore, AOR: 3.91, 95% CI:1.79-8.55 and USVI, AOR: 2.25, 95% CI:1.11-4.56). In Baltimore, factors independently associated with recent IPV were lifetime casual sex partners (AOR: 1.99, 95% CI: 1.11-3.57) and exchange sex partners (AOR: 5.26, 95% CI:1.92-14.42). In contrast, in the USVI, individual concurrency (AOR: 3.33, 95% CI:1.46-7.60), drug use (AOR: 3.16, 95% CI:1.00-10.06) and a past-year STI (AOR: 2.68, 95% CI:1.25-5.72) were associated with recent IPV history. Regarding condom use, in Baltimore, women who used condoms during vaginal and anal sex had a lower odds of recent IPV history (AOR: 0.24, 95% CI:0.08-0.72; AOR: 0.29, 95% CI:0.09-0.93, respectively). In contrast, in the USVI, condom use was associated with increased odds of recent IPV history. Findings support a critical need to continue the development and implementation of culturally tailored screening for IPV within HIV prevention and treatment programs.

STT-P53

Associations between intimate partner abuse and reproductive outcomes among women of African descent

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Mary Paterno, Desiree Bertrand[1], Doris Campbell[1], Jamila Stockman[2], Phyllis Sharps, Jackie Campbell

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Intimate partner abuse (IPA) and African heritage are well-known risk factors for adverse maternal and neonatal reproductive outcomes. The goal of this analysis was to examine IPA in association with reproductive outcomes for a sample of women of African descent in Baltimore, Maryland and the US Virgin Islands (USVI). Participants aged 18-55 were recruited from clinics for a case-control study and completed a 30-minute survey using audio computer-assisted self-interview. Cases disclosed a lifetime history of IPA; controls had no abuse history. Medical records were abstracted (n=104) for reproductive outcomes for participants who were pregnant at time of survey completion. Statistical analyses were completed using generalized linear mixed models. In analysis of records for Baltimore, cases had higher odds of delivering a small-for-gestational-age (SGA) infant (OR= 6.4; CI: 1.2-34.6) and of having a history of smoking (OR=3.4; CI: 1.2-9.6); smoking mediated the association between IPA and SGA. Analysis of combined records from Baltimore and USVI revealed a significant difference in proportion of pre-eclampsia (13.2% controls vs. 0% cases; p=.016) but when entered into a mixed model accounting for recruitment site, no statistically significant difference was found. Women of African descent in Baltimore with history of IPA may be at risk for delivering SGA infants, particularly if they have a history of smoking. Additional research is needed to examine the effects of IPA and smoking on SGA among women in USVI. Future intervention research should focus on smoking reduction among women of childbearing age with history of IPA.

Part 2:
Roundtable Abstracts
St. Thomas Campus

STT-R1

Roundtable: Census 2010: Our Declining Population

Frank Mills [*] ***(facilitator), Asha DeGannes (participant), Ayishih Bellew (participant)***
[*] *UVI Eastern Caribbean Center (ECC)*

In 2011, the US Census Bureau released the population counts for the 2010 Census of the US Virgin Islands. Many Virgin Islanders learned that on April 1, 2010 the population count of the three islands—St Croix, St John and St Thomas—was 106,405. This number represented a 2.0 percent decrease from the 2000 population of 108,612. Voices across the Territory began to question the reported population count, as they could not believe that all residents (legal and undocumented) were included in this number. As the Virgin Islands Census Data Center, the Eastern Caribbean Center (ECC) can provide insight into quality assurance for the 2010 Census. This roundtable will begin with a brief explanation of the procedures implemented to provide a complete count. Next, participants will be invited to raise questions on the process of quality control. Questions will be posed, including those surrounding the issues of decreasing birth rates and emigration to the contiguous United States. The objective of this roundtable is to discuss the implications of a decreasing population on the Territory. What does a declining population signify for the Territory in 5 to 10 years? How will this impact the labor force of the USVI? This roundtable will catalyze lively and informative discourse among Virgin Islanders and aims to discuss options relative to population change.

STT-R2

Roundtable: Insight and Action for Student Success

Camille McKayle [1] ***(facilitator), Kostas Alexandridis*** [1,2] ***(participant), Kaeche S. Liburd*** [3] ***(participant), Cira Burke (participant)***
[1]*UVI College of Science and Mathematics,* [2]*UVI Center for Marine and Environmental Studies (CMES);*
[3]*UVI Center for Student Success;* [4]*USVI Department of Education*

Increasingly, students express a strong desire to obtain a college degree. Although these students possess the motivation needed to succeed; some lack appropriate academic preparation. This results in considerable attrition between the first two years of study at universities. Attrition affects both the institution and students. Institutions are unable to plan adequately because of the loss of tuition, fees, and potential alumni contributions. Moreover, students' failure to graduate with a degree results in earning a significantly less income than one who graduated. Therefore, universities are actively engaged in research to identify underlying factors that contribute to retention. Additionally, universities are developing intervention programs to enhance academic achievement and social adjustment. This roundtable will explore how the University of the Virgin Islands is addressing the issue of retention and student success through three separate efforts: Junior University; the Center for Student Success; and the National Science Foundation, Education Research Project.

STT-R3

Roundtable: Government – Nonprofit Partnerships

Sunday Odezah [*] ***(facilitator), MPA students (participants)***
[*] *College of Liberal Arts and Social Sciences*

Nonprofits are increasingly becoming equal partners with government in providing society with essential services. By the late 1970s, the nonprofit sector had become the principal vehicle for the delivery of government-financed human services, and government had, correspondingly, become the principal source of nonprofit human service agency finance. However, the increasing reliance of nonprofits on public funds has given government an opportunity to delve into the management and oversight of nonprofits. Consequently, nonprofits are increasingly being held accountable for the results, outcomes, or impacts of government programs. Taking into account the mixed experiences with managing for results in the public sector, the paper argues that the government's practice of holding nonprofits accountable for results is counterproductive. In pursuit of this argument, the paper poses the question: "What, if anything, would best govern the partnership between government and nonprofits so that the latter would have the freedom, autonomy, and discretion to provide more and better services to the public? Wisdom literature is used to address the question with a recommendation for a more equitable and effective accountability model, namely, "shared accountability" to replace the traditional, one-dimensional accountability model. Finally, recognizing that shared accountability is not self-executing, the paper recommends some critical next steps that must be taken to make it work better for the best interest of both parties – government and nonprofits – and other stakeholders.

STT-R4

Roundtable: The lionfish invasion of the US Virgin Islands: current state of knowledge and investigating the impact on reef fish populations.

Richard Nemeth [*] ***(facilitator), Nikita Thompson, TBD participant from St. John, TBD participant from St. John, TBD participant from St. Croix, TBD participant from St. Croix, TBD participant from St. Thomas Fishermen Association***
[*] *UVI Center for Marine and Environmental Studies*

A few years ago the US Virgin Islands had its first lionfish sighting. Now they can be seen on nearly every reef and habitat from nearshore shallow reefs to offshore deep reefs. This invasion follows the typical pattern seen on many islands throughout the Caribbean. Although the USVI was proactive in developing a lionfish management plan early on and had a large community response at eradication, no systematic effort has been initiated to understand the pattern of invasion or the impacts on the local fish populations. This roundtable discussion will attempt to bring together community partners who have been actively involved in the management and eradication of lionfish and share the experiences and data that has been collected to date. The outcome of this roundtable will be to develop a territory wide spatial database which will help to guide research, monitoring and management efforts.

STT-R5

Roundtable: Health Disparities Research in the Virgin Islands

Gloria B Callwood[*] (facilitator), Doris W Campbell (participant), Edith Ramsay-Johnson (participant), Aracelis Francis (participant), LaVerne Ragster (participant), Desiree Bertrand (participant), Maxine Nunez (participant)

[*]UVI Caribbeen Exploratory Research Center

There has been little research on determinants of health outcomes of residents of the United States Virgin Islands. The Caribbean Exploratory Research Center was established within the School of Nursing in 2007 with funding from NIH National Institute on Minority Health and Health Disparities to conduct research with the goal to reduce and eliminate health disparities in the Virgin Islands. The Center has used a collaborative approach through partnering with senior researchers from major research intensive universities in mentoring faculty in developing research capacity at UVI. This involves working with UVI faculty, staff, students and community persons increase understanding of the role of research in reducing and eliminating health disparities, and provide assistance in conducting relevant research. The Roundtable will focus on studies that are ongoing or have been completed by the Center. Areas of focus will include diabetes, breast cancer, women's health, human papilloma virus, intimate partner relationships, health risk factors, men's health, climate change and public health, and outcomes of focus groups on how Virgin Islanders perceive their health. Research findings will be shared and implications for interventions and policy development/changes will be discussed.

STT-R6

Roundtable: A Rendezvous with the Horseman of Death—the Virgin Islands and Crime…

Nandi Sekou[*] (facilitator), Faculty (participant), Stakeholder (participant), Stakeholder (participant), Student (participant)

[*]UVI College of Liberal Arts and Social Science

A Rendezvous with the Horseman of Death—the Virgin Islands and Crime… This panel addresses the relevant variable for the upsurge of violent crimes in the Virgin Islands from 2000 to 2012. Criminal Justice/CJU students and faculty will present scholarly analysis of the distinct variables that have led to the increase of violent crime in the Territory. The organizing of colloquia, seminars, and panels on crime will be briefly examines. In fact, the very development of the CJU Program at the University of the Virgin Islands will be highlighted as its final review was completed on the eve of the 50th Anniversary of Charter Day. The participants of this roundtable and poster session will present information on the following major areas: 1. Socio-cultural variables that encourage criminality; 2. Economic conditions, both external and internal, that provide incentives for street crimes; 3. Political context for white collar crime and its possible relevance to economic conditions; 4. Drug trafficking and the underground economy that emanates from it throughout the Caribbean basin. This roundtable will be lively as it will tackle real issues occurring in the Territory. As Chair of the panel, I intend to invite CJU stakeholders from the Community, faculty and students to engage them in this conversation.

STT-R7

Roundtable: Creating our Future I

Patrice Johnson[1], Roy Watlington[2], LaVerne Ragster[3], Syed Gilani[4], Anne Richbourg[5], Caroline Rogers[6], Carlos Robles[7], Wayne Archibald[8]

[1]facilitator; [2]Professor Emeritus, UVI; [3]CEO, BizVI; [4]State Director of STEM; [5]Chief scientist, USGS Caribbean field station; [6]UVI Extension Specialist III; [7]UVI College of Science and Mathematics

Throughout they academic year 2011 -2012, UVI will be celebrating its Golden Jubilee, 50 years of academic excellence, "Honoring our Past , Creating our Future" The Virgin Islands Experimental Program to Stimulate Competitive Research (VI-EPSCoR) will be joining with UVI's Center for Marine and Environmental Studies (CMES) to honor the university's research past . VI-EPSCoR will also sponsor two panel discussions to mark 'Research Day' April 14th, 2012 by hosting parallel panel discussions on St. Thomas and St. Croix. These panel discussions will focus on "Creating Our Future". They will briefly discuss past research in the VI, create a picture of current research, and against this backdrop as well as the present economic climate of the USVI, offer some recommendations for future research in the USVI. The information posited in this panel discussion will serve as input for guiding the focus and direction of the next Research and Infrastructure Improvement (RII) proposal for funding which will be submitted to NSF-EPSCoR for funding. Panel discussions will take place on both St. Thomas and St Croix campuses of UVI, and panelists will be drawn from governmental (Federal and Territorial) non-governmental, academic, and commercial enterprise agencies, as well as from the agricultural sector.

Part 3:
Poster Abstracts
St. Croix Campus

STX-P1

St. Croix VIMAS: Performing Marine Outreach for a Changing Environment

Marcia Taylor
UVI Center for Marine and Environmental Studies (CMES), Virgin Islands Marine Advisory Service (VIMAS)

The Virgin Islands Marine Advisory Service (VIMAS), which is a cooperative program between the University of the Virgin Islands (UVI) and the University of Puerto Rico Sea Grant College Program, has been serving the people of St. Croix for over 20 years. VIMAS provides education and outreach specifically on marine-related issues. Although there is only one agent on St. Croix she is involved with a variety of programs and issues in order to promote wise use and conservation of marine resources. This poster highlights some of the programs over recent years that the St. Croix VIMAS agent has been involved with. These include the UVI Wetlands Reserve, Nonpoint Source Education, coral reef and fish monitoring, fisheries management, and marine debris.

STX-P2

Threats to Our Reef: The Invasive Lionfish

Bernard Castillo II
UVI College of Science and Mathematics/Chemistry and Physical Sciences

The invasion of the Atlantic waters by the Indo-Pacific lionfish (Pterois volitans/miles complex) began in the early 1990s off the coast of Florida. By 2008 the invasive lionfish made its way to the US Virgin Islands. On November 25, 2008 the first confirmed Indo-Pacific lionfish was removed from Frederiksted Pier on St. Croix. Because there are not a significant number of predators to the lionfish in the Caribbean, the invasion continues. Currently, the lionfish populations in the US Virgin Islands are estimated to be in the thousands and have spread down the Lesser Antilles toward South America. In 2011, we identified the prey of the invasive lionfish recovered off the west end of St. Croix as a means to possibly predict what aquatic species would face extinction as the invasion continues. The fish removed were characterized by sex, length, and weight. The stomach contents were analyzed by dissection and our stomach content analysis showed that juvenile wrasse, damselfish and crustaceans were the most frequent prey. Trends in the weight, length, and male to female ratio of the lionfish were also observed. Our data have showed that female lionfish were generally larger and bigger than male lionfish.

STX-P3

Drug Use and Academic Experiences of Youth in Custody of Human Services

Shareece Cannonier
UVI College of Liberal Arts and Social Sciences Graduate Student

The purpose of this study was to examine the drug use of youth as it relates to history of substance use, results of urine analysis, truancy, history of suspensions/expulsions, and number of grade retentions of 189 youth who were in the custody of the Department of Human Services

in 2008. The US Virgin Islands can benefit from having fewer adolescents who use drugs. More productive adolescents may decrease the crime rate and add more productive adults to the US Virgin Islands population. Data were gathered by the Virgin Islands Department of Human Services in 2008 and are completely anonymous. The data was analyzed to assess the relationships among history of substance use, results of urine analysis, truancy, history of suspensions/expulsions, and number of grade retentions. 27.50% of adolescents reported using drugs before. For the urine analysis, 17.50% adolescents tested positive for a drug. There was a significant correlation between all variables. The strongest was found between drug use and truancy.

STX-P4

Threats to our Reefs: Quantifying Sediment and Organic Material Production Rates from Surface Erosion Processes on the East End of St. Croix, USVI

Kynoch Reale-Munroe [1], Bernard Castillo II [1] Carlos Ramos-Scharrón[2]
[1]UVI College of Science and Mathematics; [2]The University of Texas at Austin, Department of Geography and the Environment

Water quality plays a critical role in maintaining biological integrity and preserving natural resources in aquatic ecosystems. In October 2010 the United States' Environmental Protection Agency (EPA) published a list of impaired and threatened waters in the U.S. Virgin Islands, which indicated that the most common causes of pollution were sedimentation, effluent discharges, dissolved oxygen deficiencies and bacterial contamination. Of the 33 listed sites for St. Croix, 28 or 85% of the reported impairments were due to high turbidity. The main objectives of this study were to quantify the production of sediment and organic material, due to surface erosion on small watersheds within the East End Marine Park in St. Croix. At each monitoring site, material was collected that was produced from undisturbed, vegetated hillslopes and disturbed trail surfaces, represented by an unpaved road that is currently used as a foot trail. Material was collected using sediment traps and was analyzed for the total mass of sediment and the percentage of particulate organic material present (%POM) in the sediment samples. Trail surfaces with gentle slopes (mean 11.3%) exhibited erosion rates that were 1,680 times higher than the undisturbed hillslopes, which had exceedingly steeper slopes (mean 44.3%). The sediment produced by the trail contained 3.5 times less %POM than sediment collected from undisturbed hillslopes. Annual mean erosion rates were 0.0160 and 17.8 kg m^{-2} yr^{-1} for the undisturbed hillslope and disturbed trail surfaces. Total mean %POM for undisturbed hillslopes and disturbed trail surfaces was 9.05% and 2.57%, respectively.

STX-P5

Evaluation of Drought Tolerance in 3 Native Tree Species with Landscape Potential

Michael Morgan, Tyrone Pascal and Thomas W. Zimmerman
UVI Agricultural Experiment Station (AES)

The US Virgin Islands possesses a seasonally dry climate. Therefore, plants in the USVI need to be drought tolerant. Plant species native to the USVI tend to tolerate drought better than the showy and exotic ornamental plants people like to use for landscape plantings. The objectives of

this study were: assess drought tolerance, determine growth rates, and calculate the amount of water necessary to produce plants of a size suitable for landscape planting, for three native tree species. Three weekly watering regimes were established: watering until field capacity, 1/2 and 1/3 of field capacity. Every week, for 15 weeks, height and stem diameter of the plants were measured. *Senna polyphylla* continued to grow in height under all three watering treatments. Under all three treatments, *Ceiba pentandra* grew to a certain height and then stopped growing. *Andira inermis* did not increase in height growth under any of the three treatments. Treatments did not affect diameter growth. However, all three species did not lose their leaves or appear wilted under the three watering regimes. The planting of drought tolerant native tree species around buildings and in public spaces conserves water and conserves local biodiversity. This research was funded by the USDI-USGS through the Virgin Islands Water Resources Research Institute.

STX-P6

Evaluation of weaning hair sheep lambs at 63 or 120 d of age in an accelerated lambing system in the tropics

Amy Hogg and R.W. Godfrey
UVI Agricultural Experiment Station (AES)

This study was designed to evaluate the impact of weaning age on lamb and ewe productivity in an accelerated lambing system using St. Croix White ewes (n = 42) and lambs (n = 67), and Dorper x St Croix White ewes (n = 63) and lambs (n = 85). Lambs were weaned at 63 (CTRL; n = 77) or 120 d of age (LATE; n=75). After weaning lambs were fed concentrate (2% BW/d) and grazed guinea grass. At the start of the subsequent breeding 100% of LATE and 0% of CTRL ewes were nursing lambs ($P < 0.0001$). There was no difference ($P > 0.10$) in days to first heat in the breeding season between LATE and CTRL ewes (16 vs. 14 d, respectively). Lambing rate was not different ($P > 0.10$) between LATE and CTRL ewes (72 vs. 76%, respectively). At weaning LATE lambs were heavier ($P < 0.0001$) than CTRL lambs (20 vs. 12 kg, respectively). Weaning lambs at 120 d of age in an accelerated lambing system resulted in heavier lambs at weaning with no negative impact on ewe productivity and a decrease in the amount of time that lambs received expensive, imported feed saving $13 per lamb. This work was supported by USDA-NIFA Hatch project # 0212727.

STX-P7

Evaluation of body temperature and sweating rate of Senepol cows

R.W. Godfrey[1], A.J. Weis[1], P.E. Hillman[2], K.G. Gebremedhin[2], C.N. Lee[3] and R.J. Collier[4]
[1]UVI Agricultural Experiment Station (AES); [2]Cornell University, Ithaca; [3]University of Hawaii, Manoa; [4]University of Arizona, Tucson

The objective of this study was to evaluate the body temperature and sweating rate of Senepol cows in the tropics. Primiparous (n = 3) and multiparous (n = 7) cows, 7 of which were pregnant, were evaluated in July at (2.3 to 11.4 y of age) in the sun and shade. Mean ambient temperature, relative humidity and THI during the data collection were 28.3 C, 83.7 % and 80.6, respectively. The eye temperature, surface temperature, rectal temperature, respiration and evaporative heat

loss were higher (P < 0.02) in the sun than in the shade (38.87 ± 0.14 vs. 38.19 ± 0.19 °C, 40.16 ± 0.25 vs. 34.64 ± 0.27 °C, 39.15 ± 0.06 vs. 38.93 ± 0.06 °C, 72.4 ± 0.9 vs. 68.1 ± 1.0 bpm and 344.8 ± 13.7 vs. 179.5 ± 14.9 $g/m^2/h^1$, respectively). Pregnant cows had lower (P < 0.01) rectal temperature than open cows (38.88 ± 0.07 vs. 39.12 ± 0.05 °C, respectively). Pregnant cows had higher (P < 0.001) vaginal temperature than open cows at all times of the day except during the morning (0600 to 1200 h). These data provide more information on the heat tolerance traits of Senepol cattle. This work was supported by USDA-NIFA Special Research Grant – Tropical and Subtropical Agricultural research # 2010-34135-21089.

STX-P8

Evaluation of body temperature and sweating rate of Senepol and crossbred heifers

A.J. Weis[1], R.W. Godfrey[1], P.E. Hillman[2], K.G. Gebremedhin[2], C.N. Lee[3] and R.J. Collier[4]
[1] UVI Agricultural Experiment Station (AES); [2]Cornell University, Ithaca; [3]University of Hawaii, Manoa; [4]University of Arizona, Tucson

The objective of this study was to compare body temperature and sweating rate of SEN (n = 6) and Charolais x Angus x SEN (XBRED; n = 4) heifers. There was no difference in eye temperature or respiration rate between SEN and XBRED heifers (P > 0.10). The SEN heifers had lower (P < 0.05) vaginal and rectal temperatures than XBRED heifers (38.87 ± 0.11 vs. 39.22 ± 0.13 °C and 39.14 ± 0.07 vs. 39.36 ± 0.09 °C, respectively). The vaginal temperature of SEN heifers in the shade was lower (P < 0.06) than that of XBRED heifers in sun or shade (38.75 ± .015 vs. 39.22 ± 0.18 °C, respectively). Sweating rate of SEN heifers was higher (P < 0.001) than that of XBRED heifers (23.96 ± 0.71 vs. 19.75 ± 0.93 g/m^2, respectively). Sweating rate of SEN heifers in the sun was higher (P < 0.03) than SWR of SEN heifers in shade or XBRED heifers in sun or shade (27.37 ± 1.08 vs. 20.54 ± 0.93 vs. 20.48 ± 1.32 vs. 19.03 ± 1.32 g/m^2, respectively). The higher SWR of SEN heifers may play a role in their lower RT and VT and their adaptation to the tropical climate. This work was supported by USDA-NIFA Special Research Grant – Tropical and Subtropical Agricultural research # 2010-34135-21089.

STX-P9

Crotalaria juncea L. cv. IAC-1 as a potential livestock feed and seed production crop in low-external-input mixed crop/livestock production systems for the tropics.

Stuart Weiss
UVI Agricultural Experiment Station (AES) Agronomy Program

Crotalaria juncea L. (CJ) is a tropical warm season legume that is growing in popularity in the United States as a cover crop and green manure crop that can contribute nitrogen and organic matter back into the farming system. Crotalaria was established and evaluated under two different production systems. The first system (SYS1) measured seed production with 2 harvest dates, the first at 160 DAP and the second seed harvest at 191 DAP. The second system (SYS2) combined biomass removal through a hay harvest 55 days after planting (DAP) and then seed harvest on the CJ re-growth at 195 DAP or 140 days after forage removal. SYS2 produced a mean biomass yield of 4741 kg/ha of forage on a dry matter basis which was dried, bailed for hay and subsequently fed to sheep in a separate feeding trial. SYS2 produced less seed pods per

plant (21 ±2.8, $p<0.05$)) and had fewer seeds per pod (4.7 ± 0.2, $p<0.0001$)) than either harvest 1 (30 ±2.5 and 6.6 ±0.2, respectively) or harvest 2 (29 ±2.5 and 6.4 ±0.2, respectively) from SYS1 . At the time of seed harvest, SYS2 had higher plant density with 67 plants /m2 than harvest 1 or 2 from SYS1 with 40 and 41 plants/m2, respectively ($p<0.0001$). Total seed yield was highest in harvest 1 of SYS1 producing 3,153 kg/ha ±270 which was statistically similar with harvest 2 that produced 3,115 kg/ha of seed from SYS1, but was greater than the seed harvest in SYS2 with 1,040 kg/ha of seed ($p<0.0001$). Results of this study indicate that Crotalaria juncea cv. IAC-1 can be grown in the tropics under low-external-input conditions to produce a robust seed crop, and that farmers can harvest CJ forage for livestock production and still produce and harvest a seed crop for future planting or for sale to increase farm revenue.

STX-P10

Threats to our Reef: Sediment Based Pollutant Regulation and Mitigation

Nathan Gubser[1], Kynoch Reale-Munroe[2], Bernard Castillo II[2]

[1]UVI 3-2 Engineering / Applied Mathematics Undergraduate Student, [2] UVI College of Science and Mathematics/ Chemistry and Physical Sciences

The USVI has been mandated by the Environmental Protection Agency (EPA) via the Clean Water Act to develop standards for the maximum quantities of pollutants that specific territorial bodies of water are to receive. The primary issue seen in St. Croix's associated waters is turbidity. Turbidity is the measure of water's clarity in regards to cloudiness from suspended solids via sources such as sedimentation and erosion. Boiler Bay is a site where significant terrestrial erosion is occurring from an old dirt road that directly discharges into the bay and causes turbidity. Boiler Bay is located within the St. Croix East End Marine Park (STXEEMP) and contains a myriad of protected marine environments and endangered species, such as coral and sea turtles. Previous studies at Boiler Bay estimate the annual delivery of 2.5 tons of sediment into this body of water. Sedimentation such as that from the Boiler Bay watershed has been considered one of the primary stressors to coastal aquatic habitats in the Virgin Islands.

This study utilized an EPA approved YSI 6920 sonde to gather high-resolution measurements of turbidity, conductivity, ph, and dissolved oxygen parameters. A tipping bucket rain gauge was concurrently monitoring precipitation to accompany these data sets. This combined data provided a detailed understanding of turbidity in Boiler Bay and also examined the links between these parameters and the previous study's sediment quantifications. The type of high-resolution water quality data intended for this study is commonly discussed as an important, but lacking source of information in Local Action Strategy meetings. Furthermore, this research will introduce potential schematic design options that could mitigate Boiler Bay's erosion rates and improve this aquatic environment's overall health. This research was supported by an NSF grant ""Interdisciplinary Innovations"", UVI NSF HBCU-UP Award 0506096 and the USGS through WRRI at UVI. Project number: 2011VI195B

STX-P11

Use of a Swirl Separator in a Recirculating Raft Aquaponic System: Effects on Water Quality and Production of Nile Tilapia (*Oreochromis niloticus*) and Water Spinach (*Ipomoea aquatica*)

Jason J. Danaher, R. Charlie Shultz, James E. Rakocy, Donald S. Bailey
UVI Agricultural Experiment Station (AES)

Aquaponics is an integrated fish and plant recirculating production system. The University of the Virgin Islands raft aquaponic system uses a cylindro-conical clarifier as a primary solids removal device; however, a swirl separator may offer advantages. The objectives of the 8-week experiment were to compare water quality parameters, Nile tilapia (Oreochromis niloticus) production and water spinach (Ipomoea aquatica) production in a raft aquaponic system using a clarifier or swirl separator for primary treatment of solids in the waste stream. No significant differences ($P > 0.05$) existed between treatments for temperature, oxygen, pH, total suspended solids, alkalinity, electrical conductivity, total ammonia nitrogen, nitrite-nitrogen, nitrate-nitrogen, macronutrients and micronutrients concentrations. There were no significant differences ($P > 0.05$) between treatments for Nile tilapia production, average weight, survival, or feed conversion ratio. There were no significant differences ($P > 0.05$) between treatments for water spinach production or plant tissue analysis. In conclusion, the swirl separator used in this experiment performed similar to the clarifier and water spinach grew vigorously in the raft aquaponic system. Submitted for publication in the Journal of Applied Aquaculture. The research was financed in part by the United States Geological Survey through the Virgin Islands Water Resources Research Institute grant #2009VI150B

STX-P12

Evaluation of a Parabolic Screen Filter in the University of the Virgin Islands' Aquaponic System

Jason J. Danaher, R. Charlie Shultz, James E. Rakocy, Donald S. Bailey
UVI Agricultural Experiment Station (AES)

A sustainable recirculating aquaculture system must efficiently remove and discharge total suspended solids (TSS) from the culture system. Quick and efficient removal of TSS from the system allows for increased system sustainability through improved water quality. Currently, the University of the Virgin Islands (UVI) recirculating aquaponic system uses a cylindro-conical clarifier for TSS settlement and discharge; however, a parabolic screen filter could replace the current clarifier in the aquaponic system resulting in improvement of TSS removal rates and reduction in initial capital expenses. There currently are no published research articles on the use of parabolic screen filters for water treatment in aquaponic systems. The objectives of this experiment were to compare water quality parameters, Nile tilapia (Oreochromis niloticus) production, and water spinach (Ipomoea aquatica) production between raft aquaponic systems using either a cylindro-conical clarifier (Control) or parabolic screen filter (PSF). Results for water quality were no significant differences ($P>0.05$) between treatments for temperature, oxygen, pH, alkalinity, TAN, NO2-N and NO3-N. There was no significant difference ($P>0.05$) between treatments for TSS concentrations entering either filter; however, the PSF had a

significantly higher (P=0.05) TSS concentration exiting the filtration unit compared to the Control. The PSF treatment had a significantly higher (P=0.05) TSS concentration in the net tank compared to the Control; however, there was no significant difference (P>0.05) in TSS concentration exiting the net tank. There was no significant difference (P>0.05) in the daily volume of water discharged or the daily TSS concentration discharged from either treatment. There was no significant difference (P>0.05) between treatments for macronutrient concentration in the culture water. There was no significant difference (P>0.05) between treatments for tilapia production, average weight, survival, or FCR and there was no significant difference (P>0.05) between treatments for spinach production. The PSF used in this experiment did not adversely affect fish production, water spinach production, or water quality parameters compared to the Control. Nonetheless, it was not as effective as a primary treatment device for TSS in the aquaponic system when compared to the Control. A feeding rate of 60-80 grams/m2/day of hydroponic growing area was sufficient for tilapia and spinach production as no major macronutrient and micronutrient deficiencies or toxicities were observed. Some recommendations are made for management strategies and future trials using a PSF based on observations from the present study. In Press: International Journal of Recirculating Aquaculture Vol. 12 The research was financed in part by the United States Geological Survey through the Virgin Islands Water Resources Research Institute grant #2009VI150B

STX-P13

Variety Trials of Tomato (Solanum lycopersicum L.) in the Us Virgin Islands

Dilip Nandwani
UVI Agricultural Experiment Station (AES)

Variety Trials of Tomato (Solanum lycopersicum L.) in the Us Virgin Islands Dilip Nandwani and Vanessa Forbes, Agricultural Experiment Station, University of the Virgin Islands, Kingshill, VI 00850 Tomato (Solanum lycopersicum L.) is an important commercial crop in the US Virgin Islands that is grown for fresh market. High cost of labor and management, limited water resources, weeds, diseases and pests, limited land as well as natural disasters are some of the challenges in tomato crop production in the US Virgin Islands. The objective of the current research study was to evaluate the varieties of that could produce optimum yield and quality under the local climatic conditions. Four determinate varieties of tomato `Celebrity', `Sun Master II', `Keepsake' and `PS01522942' were evaluated in fall 2011 season. All four varieties were transplanted in randomized block design with three replications at the horticulture experiment field of UVI-AES in St. Croix. Transplants were planted into rows 120 cm apart and 60 cm between plants. `Sun Master II' produced the highest marketable yield (6.6lb/plant, US#1 fruit) and `Celebrity' produced lowest (6.0lb/plant) marketable (US#1) fruits. `PS01522942' produced largest fruit (198g). `Keepsake' had earliest maturity (60days) and `Celebrity' produced first harvest in 70days.

STX-P14

The Effect of Motivation and Topic on Writing Scores on the English Proficiency Examination at the University of the Virgin Islands during Selected Years

Nancy W. Morgan
UVI School of Education

The English Proficiency Examination (EPE), is a graduation requirement of the University. Each year a committee of faculty and department heads score the examinations based on a set criteria. The criteria are pre-determined, and shared with participants on the writing prompt. Participants are scored on elements of writing skill and performance on a scale of 0-6. The prompts are scored by at least two- four persons each, and 'anchor' papers are used to determine value and examples of scores. Prompts are discussed, and, in cases where there is a great deal of disparity, there is detailed discussion of why the score should be considered a certain value, or not. In other words, there must be consensus among scoring committee members on each submission. In addition, the participants who fail to earn a passing score are given the benefit of a 'diagnostic', and are assigned an advisor to explain the/any discrepancy. There appears to be little available research on the issue of topic as relevant to the quality of writing. Although there may be many factors that affect a writer under a relatively high-pressure situation, this initial investigation of specific topic on scores should provide results for further study. Moreover, the importance of the results of the examination may have a profound effect on the student's academic, albeit life choices. This preliminary look at any possible correlation between topic and scores on the EPE is necessary to improve our overall knowledge of student performance, and to inform our best practices in offering students fair advantages and accurate evaluations.

Part 4:
Roundtable Abstracts
St. Croix Campus

STX-R1

Roundtable: The Net Generation

Mary Jo Wilder [*] ***(facilitator), Akida George (participant), Oriel Cornwall (participant), Bianka Telemaque (participant), Shaneka Pennyfeather (participant), Aisha Williams (participant), Khadisha St. Aime (participant).***

[*] *UVI College of Liberal Arts and Social Sciences/Freshman Studies*

Students from the Fall 2011 ENG 201 Research Class have developed a Power Point Presentation of twenty minutes to explore how this generation learns best. The workshop was first presented to educators at the VIWP Reading Conference this fall. The roundtable discussion will address key questions and propositions regarding the learning needs of the Net generation and will explore the opportunities and challenges of learning.

STX-R2

Roundtable: Floral Induction of Greenhouse Grown Pineapple (*Ananas comosus*)

Carlos Montilla (facilitator), Thomas W. Zimmerman (participant)

UVI Agricultural Experiment Station (AES)/Biotechnology and Agroforestry

Pineapple (Ananas comosus), is a tropical plant with an edible multiple fruit consisting of coalesced berries, is the most economically important plant in the Bromeliaceae family. Pineapples were micropropogated in vitro from material obtained from the USDA Plant Germplasm Repository. Plants were acclimatized in a greenhouse and grown to floral induction size. However, pineapple flowering may be delayed or uneven; therefore it is highly desirable to attain uniform flowering to control the time of harvest. A auxin-like plant hormone, ?-naphthaleneacetic acid (NAA) was used to induce floral development. The objective of this study is to assess the pineapples floral response of 25 ppm NAA on seven varieties of pineapples plants produced in pots in green house. The NAA was applied starting November 25, 2010 and after two weeks half received a second NAA application. Floral induction was observed after 3 weeks as the crown turned red from the accumulation of anthocyanin. Varieties likes ‘Sugar Loaf’, ‘Black Antigua’ and ‘Cabezona’, had 80% floral induction from one treatment. The varieties ‘CB-30’, ‘Sugar Loaf’, ‘Cayenne’, ‘Cabezona’ and ‘Jamaican Sugar’ had 100% floral induction following two NAA treatments. Fruits took about 6 months to develop and ripen following treatments. Fruit size was only influenced on the ‘CB-30’ variety following treeatments. Two applications of NAA are needed to ensure uniform floral induction in pineapple.

STX-R3

Roundtable: Hurricane Wind Tolerant Papaya Lines

Thomas W. Zimmerman (facilitator), Carlos Montilla (participant), Michael Morgan (participant)

UVI Agricultural Experiment Station (AES)/Biotechnology and Agroforestry

During the mid and late 1990’s the US Virgin Islands experienced frequent hurricanes which destroyed most of the papaya crops. From this experience, papaya breeding focused on

developing short and compact lines with fruit set within one meter of the soil. A papaya plot was established in a double-row system, 2 m between plants in a row, 1 m between rows and 3 m between sets of double rows. Papaya trees, seven month after transplanting, latent with fruit and in the first month of harvest, were subjected to hurricane Omar force winds in October 2008. Papaya varieties over two meters in height 'Tainung 1', 'Tainung 3', 'Tainung 5' and 'Known-You 1' had 10-20% broken stem and 75-90% were blown down. Three compact papaya lines, 1-1.5 m tall, had no broken stems and only up to 15% of the plants blown over. These results indicate that short productive trees, with a lower center of gravity, were able to tolerate hurricane force.

STX-R4

Roundtable: Creating our Future II

Nicolas Drayton[1], Ruth Blyther[2], Paul Chakroff[3], Zandy Hillis-Starr[4], Robert Godfrey[5], TBD[6], TBD[7], Alicia Barnes[8]

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Throughout they academic year 2011 -2012, UVI will be celebrating its Golden Jubilee, 50 years of academic excellence, "Honoring our Past , Creating our Future" The Virgin Islands Experimental Program to Stimulate Competitive Research (VI-EPSCoR) will be joining with UVI's Center for Marine and Environmental Studies (CMES) to honor the university's research past . VI-EPSCoR will also sponsor two panel discussions to mark 'Research Day' April 14th, 2012 by hosting parallel panel discussions on St. Thomas and St. Croix. These panel discussions will focus on "Creating Our Future". They will briefly discuss past research in the VI, create a picture of current research, and against this backdrop as well as the present economic climate of the USVI, offer some recommendations for future research in the USVI. The information posited in this panel discussion will serve as input for guiding the focus and direction of the next Research and Infrastructure Improvement (RII) proposal for funding which will be submitted to NSF-EPSCoR for funding. Panel discussions will take place on both St. Thomas and St Croix campuses of UVI, and panelists will be drawn from governmental (Federal and Territorial) non-governmental, academic, and commercial enterprise agencies, as well as from the agricultural sector.

2012 UVI Research Day Committee

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Professor of Social Sciences

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