University of the Virgin Islands

UVI Research Day

April 15, 2016

St. Croix:
UVI Great Hall

St. Thomas:
UVI Sports & Fitness Center

The UVI Research Day Committee would like to express gratitude to the sponsors of UVI Research Day 2016:

- **Office of the Provost**
- **Office of the Vice Provost for Research and Public Service**
- **Agricultural Experiment Station***

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UVI Research Day 2016

Poster, Roundtable and Demonstration Proceedings

April 15, 2016

St. Croix:
UVI Great Hall, Albert A. Sheen Campus
(10:00 a.m. – 3:00 p.m.)

St. Thomas:
UVI Sports & Fitness Center
(9:00 a.m. – 3:00 p.m.)

University of the Virgin Islands

Historically American. Uniquely Caribbean. Globally Interactive.

Office of the President

MESSAGE FROM DR. DAVID HALL
PRESIDENT OF THE UNIVERSITY OF THE VIRGIN ISLANDS

It is my distinct honor and privilege to welcome you to the fifth annual ***UVI Research Day***! The University of the Virgin Islands embraces the unique responsibility that we have as the only public institution of higher education in the Territory to provide educational programs that address the challenges and embrace the opportunities that impact the Territory and the region. We at UVI are truly excited about the pivotal role that the University continues to play in the effort to respond to issues and challenges that have impacted the Territory, the wider Caribbean region, and beyond. One of the most thoughtful ways of doing this is through scholarly endeavors, chief of which is the conduct and pursuit of research endeavors. Today's UVI Research Day provides an opportunity for faculty, students and staff within the institution to showcase the research that they have undertaken to highlight diverse topics that impact our community and region.

The University is a leader in securing federal grants. We bring in approximately $20 million a year from various federal agencies. This far exceeds the average for Historically Black College and Universities. The reason for our exceptional performance in this area is the quality of the research that our faculty and students engage in each year. It is through the research of our faculty and students that we remain relevant to the Virgin Islands and the world. It is through the exploration of new areas, new boundaries and reformatted conceptions that we learn about the world in which we live. Our students and faculty are in the midst of these discoveries and explorations every day. Though it may take years for some of this work to bear fruit, it is central to the mission of this University.

I am especially proud of Dr. Frank Mills for his leadership in regards to the development and implementation of Research Day. This started as part of our 50th Anniversary celebration, and now it has become an annual part of our institution. It helps us to annually showcase the best of what we are doing to push the boundaries of our knowledge.

Congratulations to the organizers and all those who worked tirelessly to ensure the success of this year's UVI Research Day! Research is the key to new worlds, and this day is an opportunity to see the worlds that our faculty and students are exploring and creating. I am confident that the day will be both educational and inspirational. Thank you for taking the time to experience this research showcase of the University.

Sincerely,

David Hall

David Hall, SJD
President

University of the Virgin Islands

Historically American. Uniquely Caribbean. Globally Interactive.

Office of the Provost

MESSAGE FROM PROVOST AND VICE PRESIDENT FOR ACADEMIC AFFAIRS CAMILLE A. MCKAYLE, PHD RESEARCH DAY 2016

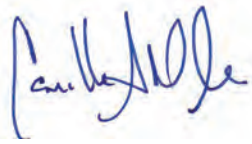
Welcome to Research Day 2016! Research and scholarship distinguishes academia from many other pursuits. Research Day allows you to get a glimpse into that which motivates our faculty to want to produce the next generation of scholars. Without scholarship, an academic discipline becomes a thing of the past.

A prominent goal of *Pathways to Greatness,* UVI's strategic plan for 2012-2017, is to "increase faculty productivity and effectiveness by expanding research and faculty scholarship expectations and opportunities". As faculty pursue this goal, they bring along and inspire students through mentoring, and sometimes jointly publishing articles. Those students who participate in UVI's special undergraduate research training programs go on to complete PhD programs at a rate (85%) that far exceeds the national average (50%) and a few of those PhD recipients return to become UVI faculty, and continue the cycle.

One aspect of the research presented that should not be overlooked is the relevance to our Virgin Islands Territory, as well as the region. The University of the Virgin Islands utilizes its resources and stature as a university to add value to the Territory by exploring issues and projects in order to add to our understanding of the world immediately around us. These are addressed in a manner and with a rigor that result in publication in journals at the national and international levels, often at premiere journals in a discipline.

UVI's Research Day epitomizes the University's mission: excellent teaching, innovative research, and responsive community service.

Welcome, enjoy, and be inspired.



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Office of the Vice Provost for Research and Public Service

MESSAGE FROM VICE PROVOST FOR RESEARCH AND PUBLIC SERVICE

UVI is at that stage of its Strategic Plan 2017 where it can observe a distinct trajectory of growth in the quality and number of research projects that are on display in our fifth *UVI Research Day* exposition. The Strategic Plan accentuated the need for an enhanced level of research if UVI were going to succeed in its quest of Pathways to Greatness, and the *UVI Research Day* event has evolved as one vehicle that can help the institution to achieve its related Performance Goal.

The organizing Steering Committee of *UVI Research Day* continues to be thrilled by the very positive response that has been forthcoming from local high schools' seniors and juniors through the collaboration of their principals and teachers in both districts. The students' excitement with what they observe and hear inspire us, not only because they are stimulated by the research of our students, faculty and staff, but also because of the real possibility that some of them would be elated enough to want to enroll at UVI.

We are particularly pleased that we can continue to offer this opportunity to our UVI students for the public exposure of their work. Their numbers have been increasing, and the enduring participation by teaching and research faculty makes evident that they have bought into the mantra that *great research informs great teaching.* Both President Hall and Provost McKayle are singled out for their staunch support and the various ways in which they have patronized this event since its initiation.

We particularly welcome the Virgin Islands public to *UVI Research Day* for taking the time to observe the product of the work of students and faculty, for they often have different but valuable perceptions that help to improve our research.

Finally, I wish to compliment all students who have entered their poster presentations in competition for the student awards, and may they be encouraged by the thought that even if they aim for but do not reach the stars, they will fall above the trees.

Frank Mills

Frank L. Mills
Chair, *UVI Research Day* Steering Committee

#2 John Brewers Bay ● St. Thomas ● U.S. Virgin Islands 00802-9990 ● Tel: (340) 693-1062 Fax: (340) 693-1065

Event Program

Friday, April 15, 2016

ST. CROIX

UVI Great Hall, Albert A. Sheen Campus, 9:00 am – 3:00 pm

a. Poster presentations and display:	10:00 am – 3:00 pm
b. Opening and keynote address:	11:00 am – 11:30 am
c. Roundtable discussions:	
1. Racism: Where Do We Go From Here?	10:00 am – 11:00 am
2. Collaborative Action Research On Mathematical Modeling Of Water Quality With Stem Teachers	1:00 pm – 2:00 pm

ST. THOMAS

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

a. Poster presentations and display:	9:00 am – 3:00 pm
b. Opening and keynote address:	10:30 am – 11:00 am
c. Roundtable discussions:	
1. Safe Sexting	11:30 am – 12:30 pm
2. Sexual Selection and its Relation to Isolative Reproduction in Three-spine Stickleback (Gasterosteus aculeatus)	12:00 noon – 1:00 pm
3. Racial Profiling	1:00 pm – 2:00 pm
4. Marine Disease Management	1:00 pm – 2:00 pm
5. An investigation of performing practices of entering high school music students into the University of the Virgin Islands instrumental music program; through examination of curriculum design, performance requirements, teacher preparation, with panelist recommendations for further studies	2:00 pm – 3:00 pm
6. Effective Social Media Use in the VI: How/Why it Can Work Better	2:00 pm –3:00 pm

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UVI Research Day Committee 2016

UVI Research Day Planning Committee Members:
Frank Mills, Committee Chairperson and Awards Subcommittee Chair
Stafford Crossman, Logistics Subcommittee Chair AAS
Ayishih Bellew, Program Subcommittee Chair
Dara Cooper, Public Relations Subcommittee Chair
Dale Morton, Logistics Subcommittee Chair STT

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Carrie Bucklin
Howard Forbes Jr
Rhuanito Ferrarezi
Denis Griffith
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Mary Joe Williams
Karen Jones
John Osoinach
Gabriel Ogunmokun
Stevie Henry

Support Staff:
Ayishih Bellew
Corene Jn-Charles
Deshona Liburd-Williams
Lorna Chesterfield

Logistics Sub-Committee:
Dale Morton- Chair STT
Stafford Crossman- Chair AAS
Corene Jn-Charles
Karen Jones

Program Sub-Committee:
Ayishih Bellew-Chair
Rhuanito Ferrarezi
Denis Griffith
Deshona Liburd-Williams

Public Relations Sub-Committee:
Dara Cooper-Chair
Dale Morton
Howard Forbes Jr
Tamika Thomas Williams
Carrie Bucklin
Ayishih Bellew
Mary Joe Williams
John Osoinach
Stevie Henry

Awards Sub-Committee:
Frank Mills-Chair
Howard Forbes Jr
Rhuanito Ferrarezi
Ayishih Bellew

St. Croix Poster Abstracts,
Albert A. Sheen Campus

Assessment of basil varieties for production in the UVI Aquaponic System

***Donald Bailey**, Staff, Agricultural Experiment Station*
***Seti Balkaran**, Undergraduate Student, Agricultural Experiment Station*
***Jomanni Bernier**, Undergraduate Student, Agricultural Experiment Station*
***Rhuanito Ferrarezi**, Faculty, Agricultural Experiment Station*

Two trials were conducted in the UVI Aquaponic System with the objective to assess different basil varieties for production in aquaponics. In the first trial we evaluated five varieties (Genovese, Spicy Globe, Lemon, Purple Ruffles and Red Rubin) and in the second trial seven varieties (Genovese, Spicy Globe, Lemon, Purple Ruffles, Red Rubin, Thai and Cinnamon). In both trials, 3-week old seedlings were transplanted in net pots at a density of 16 plants/m^2. The first trial was harvested every 28 days and the second trial was harvested before blooming, ranging from every 21 to 28 days. Plants were harvested by "cut and come again" in which stems were cut 15 cm above the root. The harvested plant material was weighed for yield determination. The plant was allowed to regrow until the next harvest. All varieties were harvested four times. Two plants were removed completely at each harvest to determine dry mass. Plant morphology (height and width), anthocyanin and chlorophyll content were measured before each harvest. In the first trial, Genovese basil had the highest total yield and Purple Ruffles the lowest (3.69 and 1.03 kg/m^2/harvest) respectively($p<0.0001$). In the second trial Cinnamon basil had the highest total yield and Purple Ruffles the lowest (1.66 and 0.42 kg/m^2/harvest) ($p<0.0001$). The total yield reflected the measured plant morphology. Varieties with smaller plant size can be spaced closely to increase total yields.

STX-P1

Harvest timing and inorganic-nitrogen alternatives impact on lignocellulosic characteristics and yield under an intensified climate

***Kenneth Paul Beamer**, Staff, Agricultural Experiment Station*
***Stuart Weiss**, Staff, Agricultural Experiment Station*
***Thomas Geiger**, Staff, Agricultural Experiment Station*

Switchgrass (*Panicum virgatum* cv. Alamo) and guinea grass (*Panicum maximum* cv. Mombaza) have been proposed as sustainable alternatives to fossil fuels although they still require non-renewable inputs, notably, inorganic-nitrogen (N). Further, climate change forecasts suggest the southeastern USA may emulate more tropical or subtropical growing conditions. Objectives were to determine: i) effects of biochar (1 and 2 Mg ha-1), two intercropped legumes [sunn hemp (*Crotalaria juncea* cv. Tropic Sun: SH) and pigeon pea (*Cajanus cajan* cv. Mandarim: PP) intercrops] versus inorganic N [67 kg ha-1and 0 kg ha-1 (control)] on desired feedstock characteristics, yield, and soil characteristics; ii) tissue-nutrient levels over three harvest dates in a two-factor randomized block design; and, iii) switchgrass adaptation to more extreme (tropical) growing conditions. For both *Panicum* species, yields and feedstock characteristics were influenced by harvest timing ($P<0.05$), whereas soil amendments influenced these components to a lesser extent ($P>0.05$). Results suggest pigeon pea and sunn hemp inter-crops, and biochar may supply analogous-N as synthetic fertilizers ($P\leq0.05$). Initial harvests had the highest amounts of digestible 5 and 6 carbon sugars and N, P, and K tissue levels. Switchgrass adaptation was moderate (5-30% weed cover). Results suggest feedstock maturity stage can be manipulated for desired traits, whereas intercropping and amendments impact tissue composition to a lesser extent.

STX-P2

Using ELISA to Detect Cucumber Mosaic Virus in Sweetpotato Seedlings

***Imani Dailey**, Undergraduate Student, Agricultural Experiment Station*
***Thomas Zimmerman**, Faculty, Agricultural Experiment Station*

Cucumber Mosaic Virus is one of the most prolific plant viruses that has a wide host range including sweetpotato. The objective of this research was to use ELISA to detect the presence of Cucumber Mosaic Virus in six-month-old sweetpotato seedlings. Cuttings from field-grown sweetpotato seedlings were established in the Agricultural Experiment Station (AES) green house. Leaf samples were collected from seventy-seven (77) sweet potato plants and tested using an ELISA test kit from Agdia. Thawed leaf samples were ground in a phosphate extraction buffer with sand in a mini-bead beater for 60 seconds. In a 96 well titer tray, 100 ml of supernatant was reacted with ELISA antibodies which resulted in a yellow color reaction if testing positive for the virus. As a negative control, in vitro virus-free tissue from USDA varieties were used. The positive control was from leaf tissue of locally grown Caribbean varieties. This research was supported by USDA-Hatch and USDA-NIFA-Insular Tropical Grant funds.

STX-P3

Evaluation of Sweetpotato Skin Pigments from Cooked and Uncooked Tuberous Roots

***Shamali Dennery**, Undergraduate Student, Agricultural Experiment Station*
***Thomas Zimmerman**, Faculty, Agricultural Experiment Station*

A spectrophotometer uses specific wavelengths of light to measure the transmittance of a liquid solution. The objective was to determine if spectrophotometric readings could be used to determine sweetpotato skin pigment colors from cooked and uncooked tuberous roots. Sweetpotato seedlings from crosses between purple skin sweetpotatoes and red or white skin varieties were evaluated fresh or cooked. Three corkborer sweetpotato skin samples were extracted in 70% ethanol and sand using a 2 ml vial in a mini-bead beater for 60 seconds. Spectrophotometric peaks were determined by scanning extracts from sweetpotato skins from 360 to 1,000 nm. Absorbance peaks were found to be at 490 and 910 nm. Results indicated that only the 490 wavelength provided reproducible readings that correlated with sweetpotato skin color. Cooking the sweetpotatoes resulted in lower spectrometric than uncooked skins. A reading above 0.230 for uncooked and 0.170 for cooked were purple skinned sweetpotatoes. A spectrophotometer at 490 nm can be used to distinguish between purple and pink skin of sweetpotatoes. This research was supported by USDA-Hatch and USDA-NIFA-Insular Tropical Grant funds.

STX-P4

Partial root and canopy cut to increase cantaloupe fruit sweetness in the UVI Aquaponic System

***Rhuanito Ferrarezi**, Faculty, Agricultural Experiment Station*
***Seti Balkaran**, Undergraduate Student, Agricultural Experiment Station*
***Jomanni Bernier**, Undergraduate Student, Agricultural Experiment Station*
***Donald Bailey**, Staff, Agricultural Experiment Station*

Plant water stress imposed during the reproductive stage of fruit crops are well-known for increasing flowering and fruit quality. However, deficit irrigation is challenging to apply on recirculating aquaculture systems as the aquaponics, which uses deep water hydroponic troughs for vegetable production. Our study aimed to evaluate the increase of cantaloupe sugar content in the UVI-AES Aquaponic System by partially cutting the root system and/or canopy to reduce both water uptake and evapotranspiration. The study was performed in Fall 2015. 'Goddess' was seeded on peat-based substrate on Sept 10 and transplanted to styrofoam rafts on the aquaponics system on Oct 2. We used 2 plants/raft spaced every 1.2 × 1.2 m (12 rafts/trough). Our treatments were the combination of different percentages of root and canopy partial cut (0, 25%, 50% and 75%) in two harvest periods (10 days after cutting or at fruit maturation), resulting in 24 treatments with two replications each. The root and canopy cutting was performed on Nov 7. The first harvest was performed on Nov 17 (68 days after transplanting). Partial root and canopy cut did not increase sugar content ($p>0.05$), but significantly affected total yield ($p=0.0130$) and fruit pulp thickness ($p=0.0271$). No response was found on fruit length and width, fruit hardness, leaf chlorophyll and anthocyanin ($p>0.05$). More research is necessary to develop a cropping system suitable for increasing cantaloupe fruit sweetness in aquaponics.

STX-P5

Sensor-based irrigation in different sweet pepper varieties in the U.S. Virgin Islands

***Rhuanito Ferrarezi**, Faculty, Agricultural Experiment Station*
***Kalunda Cuffy**, Undergraduate Student, Agricultural Experiment Station*
***Thomas Geiger**, Staff, Agricultural Experiment Station*

Sweet peppers are widely produced in the Caribbean islands. Farmers usually water the plants without using the proper water management techniques. Soil-based monitoring systems can be used to improve water use efficiency and save water resources. Our study evaluated the use of low-cost open-source equipment to control irrigation and the potential yield of sweet pepper varieties in a Sion clay soil. We tested two soil moisture contents to trigger irrigation (0.32 and 0.42 m3/m3) and six varieties (Aristotle, Declaration, Intruder, Jupiter, Sweet Chocolate Belle, and Vanguard), in a CRD with three replications, totaling 36 experimental units. We constructed three fully automated irrigation systems using an Arduino Mega, a logging shield, twelve 10HS soil moisture sensors, two 5-VDC 8-module relay drivers and twelve 24-VAC 1-inch solenoid valves. The irrigation was assembled using a manifold built with 1-inch PVC pipe, one solenoid valve and 3/4-inch polyethylene tubing with 4-L/h drip emitters. The soil moisture sensors malfunctioned over time, not controlling the irrigation properly. Irrigations were performed manually. The two moisture treatments were averaged, resulting in six replications per variety. The total and marketable yield, leaf chlorophyll and fruit weight, width, length and sugar content were not different ($p>0.05$). Total yield ranged from 13,514 (Declaration) to 16,940 kg/ha (Vanguard). All six varieties are suitable for cultivation in the U.S. Virgin Islands.

STX-P6

Greenhouse production of slicing cucumbers in the U.S. Virgin Islands

***Thomas Geiger**, Staff, Agricultural Experiment Station*
***Kalunda Cuffy**, Undergraduate Student, Agricultural Experiment Station*
***Rhuanito Ferrarezi**, Faculty, Agricultural Experiment Station*

Cucumber is one of the major vegetables in greenhouse production. Little information is available regarding the cultivation of cucumbers in closed environment at the U.S. Virgin Islands. Our study evaluated the production of slicing cucumber in greenhouse under different substrate moisture contents applied using low-cost open-source microcontrollers. We tested four slicing cucumber varieties (Boa, Bomber, Corinto and Summer Dance) and three substrate moisture contents to trigger irrigation (0.24, 0.36 and 0.48 m3/m3), on a split-plot CRD and three replications. Plants were transplanted into 2.5 gallon pots with Pro-Mix BX Mycorrhizae: perlite substrate (70%: 30% v/v). We constructed two solar-powered fully automated irrigation systems using an Arduino Mega, a logging shield, eighteen 10HS soil moisture sensors, three 5-VDC 8-module relay drivers and eighteen 24-VAC 1-inch solenoid valves. The soil moisture sensors malfunctioned over time, not controlling the irrigation properly. Irrigations were performed manually every other day. The three moisture treatments were averaged, resulting in nine replications per variety. Corinto (22,436 kg/ha) and Boa (20,000 kg/ha) total yield were higher than Summer Dance (10,604 kg/ha) and Mountie (10,435 kg/ha) ($p=0.0001$). The marketable yield was respectively 85%, 91%, 63% and 40% of the total yield ($p<0.0001$). Based on our study, Corinto and Boa are the recommended varieties for greenhouse cultivation in the U.S. Virgin Islands.

STX-P7

Evaluation of the relationship between body temperature and grazing behavior in hair sheep in the tropics

***Robert Godfrey**, Faculty, Agricultural Experiment Station*
***Amran Nero**, Undergraduate Student, Agricultural Experiment Station*
***Gilbert Roberts**, Undergraduate Student, Agricultural Experiment Station*
***Sue Lakos**, Professional Staff, Agricultural Experiment Station*

Heat stress is a common problem in ruminant livestock production throughout the tropics. In order to make maximal use of available forages livestock need to spend adequate time grazing to meet their nutritional requirements, even under the hot, humid conditions found in the region. By evaluating the grazing behavior and body temperature of livestock it may be possible to determine if there is a set point in body temperature when the animal ceases grazing and seeks out the shade to help maintain a thermoneutral state. The objective of this project is to evaluate the relationship between environmental conditions, body temperature and grazing behavior in hair sheep in the tropics. Non-pregnant, non-lactating mature St. Croix White (n = 10) and Dorper x St Croix White (n = 10) ewes will be equipped with GPS tracking collars and vaginal temperature data loggers for 1 week each month to monitor location in the pasture and body temperature. Three times each day visual observations will be conducted to record location, behavior and posture of sheep. Data will be analyzed to determine if there is a relationship between body temperature and grazing behavior. Preliminary data is being presented to display the diurnal profile of ewe body temperature and the grazing behavior during the first 4 months of data collection.

STX-P8

Evaluating microirrigation performance on okra cultivation in the U.S. Virgin Islands

***Jayar Greendice**, Undergraduate Student, Agricultural Experiment Station*
***Jordan Atemazem**, Undergraduate Student, Agricultural Experiment Station*
***Thomas Geiger**, Staff, Agricultural Experiment Station*
***Rhuanito Ferrarezi**, Faculty, Agricultural Experiment Station*

Agriculture uses the majority of the potable water available in the planet, with irrigation accounting for 70% of global water withdrawals. Drip irrigation is the most common system used in agriculture because of the higher irrigation efficiency and the application of low water volumes, resulting in water saving when compared to sprinkler irrigation. However, the equipment used plays an important role in the irrigation uniformity and efficiency. Most of the U.S. Virgin Islands farmers are using drip tapes with non-compensating emitters, applying more water than needed. Consequences include reductions in crop yields and a waste of water resources. Our objective is to evaluate the performance of compensating and non-compensating emitters on okra plant growth. We created an experimental module with a table and a suspended reservoir to understand the hydraulic behavior of the different equipment without the interference of water quality and the factors related to the equipment installation in the field. We also estimated the coefficient of variation, the Christiansen uniformity coefficient, and the distribution uniformity coefficient in the field. Plant growth parameters were also recorded. The use of more efficient equipment is important to reduce the water use and save the water resources for other applications.

STX-P9

Comparison of plasma and hair cortisol concentrations in St. Croix White hair sheep ewes and lambs in response to weaning with or without fence line contact

***Sue Lakos**, Staff, Agricultural Experiment Station*
***Juliet Ruggiero**, Undergraduate Student, Agricultural Experiment Station*
***Sierra Lockwood**, Graduate Student, Dept of Animal Science, University of Tennessee, Knoxville*
***Hank Kattesh**, Faculty, Dept of Animal Science, University of Tennessee, Knoxville*
***Robert Godfrey**, Faculty, Agricultural Experiment Station*

This study evaluated the impact of weaning on cortisol concentrations in sheep. Treatments were weaning at 120 d of age with fence line contact (FL, n = 15 lambs, 10 ewes) or no contact (NFL, n = 15 lambs, 11 ewes) between ewes and lambs. On d 1 ewes and lambs were placed in a pen. On d 2 lambs were separated from ewes and put in a pen adjacent to the ewes (FL) or 10 m distant (NFL). On d 3 the ewes returned to pasture. Lambs remained in pens for 1 wk. Ewe and lamb jugular blood samples were collected on d 1, 2, 3 and 28. Plasma was analyzed for cortisol concentration by RIA. On d 1 and 28 hair samples were collected from ewes and lambs and analyzed for cortisol concentrations by ELISA. Data were analyzed using SAS with treatment and day as the main effects. Ewe plasma cortisol was not different ($P > 0.10$) between treatments but decreased between d 2 and 3 in FL ($P < 0.03$) and NFL ewes ($P < 0.04$). On d 28 FL ewes had greater ($P < 0.05$) cortisol concentrations than NFL ewes. Ewe hair cortisol was not different between treatments or day ($P > 0.10$). Plasma cortisol of lambs was not different ($P > 0.10$) between treatments but increased between d 2 and 3 in FL lambs ($P < 0.04$) and d 1 and 3 in NFL lambs ($P < 0.02$). Lamb hair cortisol increased between d 1 and 28 ($P < 0.002$). Ewe plasma cortisol concentration decreased as lamb plasma cortisol increased during weaning indicating that lambs may be experiencing more stress at weaning than ewes.

STX-P10

Six Pitaya Varieties for the Virgin Islands

Carlos Montilla, *Staff, Agricultural Experiment Station*
Henry Harris, *Staff, Agricultural Experiment Station*
James Gordon, *Staff, Agricultural Experiment Station*
Raheem Smart, *Staff, Agricultural Experiment Station*
Thomas Zimmerman, *Faculty, Agricultural Experiment Station*

Dragon Fruit or Pitaya is a cactus related to the climbing local night blooming cereus. Six Pitaya varieties were established in a former wire trellis system in the University of Virgin Islands. The objective was to determine production potential over time. The six varieties selected were: 'Dark Star', 'Delight Halley's Comet', 'Makisupa', 'Physical Graphitic' and 'Purple Haze'. The varieties were evaluated by weight, size and soluble sugar content (%Brix) and collected over four consecutive years. Plant growth and flowering were monitored monthly and data recorded on ripe fruit. All flowers were naturally pollinated at night by bats and moths so no hand pollination was required. All fruit ripened in 28-33 days after flowering. Fruiting rates varied between months and years with production increasing in older plants. The soluble sugar content was consistent over time but fruit weight varied. This research was supported through grants from USDA Regional Hatch and USDA Specialty Crops Block Grant administered by the VI Agriculture Department.

STX-P11

Aquaponic waste as nutrient source for duckweed production used for fish feed

Amro Mustafa, *Undergraduate Student, Agricultural Experiment Station*
Donald Bailey, *Staff, Agricultural Experiment Station*
Rhuanito Ferrarezi, *Faculty, Agricultural Experiment Station*

The UVI-AES aquaponic system produces tilapia and vegetable/ornamental crops in an integrated recirculating system. Waste products from fish metabolism are dissolved in the water and treated by nitrifying bacteria before the water is recycled back to the fish tanks. The fecal waste is removed from the system as a slurry mix of solids and water. The mineralized sludge waste water can be used to grow crops to fed the fish instead of being discharged into the environment. Producing plant-based feed to supplement the tilapia diet and substitute for purchased feed can also reduce the aquaponics operation costs. Our objective is to determine the optimal nitrate concentration for duckweed production. We tested four nitrate concentrations (0, 27, 54 and 80 mg/L) on twelve 3.6-m diameter × 1.22-m deep round culture tanks, with three replications. Initial sludge nutrient content and proximate analysis, and weekly water quality analysis, duckweed harvest and yield determination will be performed during 12 weeks. Our goal is to establish the guidelines for duckweed production at the U.S. Virgin Islands, providing basic information to increase the aquaponics production in the territory and creating a possible source of incoming for local farmers interested in growing duckweed for aquaponics growers.

STX-P12

Evaluation of the gastrointestinal parasite burdens around the time of parturition in hair sheep in the tropics

***Amran Nero**, Undergraduate Student, Agricultural Experiment Station*
***Sue Lakos**, Professional Staff, Agricultural Experiment Station*
***Robert Godfrey**, Faculty, Agricultural Experiment Station*

The objective of this study was to compare the periparturient parasite burden in two breedtypes of hair sheep ewes. Beginning at d -28 (parturition = d 0) through d 63, fecal and blood samples were collected from St. Croix White (STX; n =10) and Dorper x STX (DRPX; n = 9) ewes weekly to measure fecal egg counts (FEC) and packed cell volume (PCV). The modified McMasters technique was used to determine FEC reported as egg/g. Ewe body weight (BW) and FAMACHA score (indicator of anemia) were also measured on each sampling day. Data were analyzed using GLM procedures of SAS with breed and time in the model. Ewe BW decreased after parturition in STX and DRPX ewes ($P < 0.0001$). PCV was not different between STX and DRPX ewes at any time during sampling ($P > 0.10$). FEC was higher in DRPX than in STX ewes ($P < 0.03$). There was no detectable rise in FEC during either the pre- or post-partum period in either breed ($P > 0.10$). FAMACHA score was higher in DPX than in STX ewes ($P < 0.006$) and decreased over time in both breeds ($P < 0.001$). These parasite resilient genotypes do not appear to have a periparturient gastrointestinal nematode rise, as has been identified in other breeds, under conditions found in the tropics.

STX-P13

Papaya Growth: Comparison over Four Non-consecutive Generations

***Tyrone Pascal**, Undergraduate Student, Agricultural Experiment Station*
***Thomas Zimmerman**, Faculty, Agricultural Experiment Station*

Papaya trees are generally known for bearing fruit above 2 meters, the UVI-AES-Biotechnology program has been developing papaya trees that begin to produce fruit closer to the ground between 70 cm to 100 cm from the soil surface. The objective was to study varietal integrity over time from open-pollinated seeds of hermaphroditic plants. This research allowed us to evaluate seven varieties from four growing seasons spanning 2008 to 2015. The varieties were: 'Known You' (KY), Maradol, 'Tainung #5' (TNG5), 'TW', 'HYx5', 'FWxC', and 'UVI'. Data was collected monthly from for plant height, height to first fruit, fruit set and stem diameter at 1 meter. There was no significant difference in plant height or stem diameter within a variety among the four growing seasons. Significant difference among years for fruit production was observed in 'Maradol', 'TW', 'UVI', and 'FWxC'. Significant differences among years for height to the first set fruit were observed in 'Maradol', 'TW', 'FWxC' and 'HYx5'. Factors that may have caused these differences between years include the presence of papaya ringspot virus and extended drought. Saving seed from inbred papaya from hermaphroditic plants retains varietal integrity. This research was supported by USDA-Hatch and USDA-NIFA-Insular Tropical Grant funds.

STX-P14

Utilizing the Cover Crop Sunn Hemp (*Crotalaria juncea* L.) to Improve Vegetable Cropping Systems

***Stuart Weiss**, Faculty, Agricultural Experiment Station*
***D. Treadwell**, Faculty, University of Florida*
***R. Ferrarezi**, Faculty, Agricultural Experiment Station*
***K. Beamer**, Staff, Agricultural Experiment Station*

Sunn hemp (*Crotalaria juncea* L.; [SH]) is an important warm season cover crop that has the potential to provide ecosystem services and cover crop legacy effects to subsequent vegetable crop rotations. One alternative management strategy is to terminate SH with a roller-crimper and utilize SH residue as a weed suppressive mulch layer for no-till vegetable transplanting. Adoption of this practice by small farmers could reduce soil disturbance, provide extended weed suppression, and increase the soil's water holding potential. A series of experiments were conducted in the US Virgin Islands (USVI) and Florida to compare cropping systems where the SH cover crop was soil incorporated followed by three common weed management practices (plastic film mulch, cut and carry hay mulch, and bare ground with no mulch) to SH surface mulch produced from SH terminated with a roller-crimper. Peppers (*Capsicum annum*) were evaluated to determine cropping system productivity. Cut and carry hay mulch systems provided a high level of weed suppression and resulted in the greatest pepper yields compared to either the no mulch or plastic mulch systems. Sunn hemp mulch served as an effective means to suppress weeds and produced comparable yields to conventional systems. Sunn hemp terminated with a roller-crimper, followed by no-till vegetable transplanting can reduce soil disturbance and can provide adequate weed suppression in vegetable cropping systems.

STX-P15

The Substance Abuse & HIV/AIDS Prevention Program

***Dr. Doris Battiste**, Staff, Caribbean Exploratory Research Center*
***Alyssa Ryan**, Staff, Caribbean Exploratory Research Center*
***Dr. Kimarie Engerman**, Faculty, College of Liberal Arts and Social Sciences*
***Shaniqua Hodge**, Undergraduate Student, College of Liberal Arts and Social Sciences*

The prevalence of substance abuse and the high rate of HIV infection in the Virgin Islands among young adults are alarming and create challenges for schools, the Health Department, the criminal justice system and the community as a whole. As such, the University of the Virgin Islands (UVI) Substance Abuse & HIV/AIDS Prevention Program was developed to reduce drug use and abuse and prevent the transmission of HIV among 18-24 year old students enrolled at the UVI and those residing in the surrounding community. The objectives of the project are to increase the number of first-time HIV testers and HIV testing opportunities; decrease alcohol consumption of college students and other participants by 30% and 10% respectively; and increase awareness and knowledge by 25%. The target population consists of African American/Black and Hispanics/Latino. Through partnership with Community Based Organizations (CBOs), the program addresses community norms that serve as barriers to reducing and preventing substance abuse and the transmission of HIV.

STX-P16

Homicide Victimology in St. Croix, U.S. Virgin Islands

***Iziah Ashe**, Undergraduate Student, College of Liberal Arts and Social Sciences*
***Aletha Baumann**, Faculty, College of Liberal Arts and Social Sciences*

Homicides have been in existence since the beginning of time. The age and gender of victims and offenders have not changed significantly. Reports from Trinidad and Tobago indicate that late teens and early adults are most likely homicide victims and perpetrators. A study covering several Caribbean countries found that females are most likely victims of homicide while males are most likely to commit homicides. According to a U.S. Bureau of Justice report, the homicide rate is higher in urban than in rural areas. The purpose of this study will be to determine if certain ages, genders, and locations are overrepresented in homicide victims in St. Croix. For this study, urbanity will be defined by population density; the nine subdistricts in St. Croix will be divided into low, medium and high population density groups. Homicide reports are available from the Virgin Islands Police Department for the years 2000 through 2015 and will be used to determine if the age and gender of the perpetrators and location of the deceased in St. Croix differ from the population in based on the 2010 U.S. Census. Chi-Square Goodness of Fit tests will determine if homicide characteristics are typical of the population in St. Croix.

STX-P17

The Impact of Robbery on Owners and Employee of Jewelry Stores

***Seti Balkaran**, Undergraduate Student, College of Liberal Arts and Social Sciences*
***Aletha Baumann**, Faculty, College of Liberal Arts and Social Sciences*

This is a qualitative study which will explore the psychological and physiological impact of robbery on owners and employees of jewelry stores that have been robbed. Participants will be studied from up to 10 jewelry stores on St. Croix, which will include one owner and one employee from each store. Approval from five jewelry stores has already been given by five jewelry store owners whose stores have been robbed within the past five years to participate in the research. Interviews will be audiorecorded (if permission is granted) or handwritten notes will contain of questions based on the physical and psychological change of the victims of robbery; including frequency of robbery and use of weaponry; reactions of owners, employees who were present and customers; changes made to the store and personal property; stress reactions; and their recovery process. Upon completion of the interview the participants will be thanked and given a list containing contact information on professional psychologists, as well as a pamphlet containing information on trauma and stress. The information received from the participants will be analyzed through coding and identification of themes using the phenomenological method of qualitative analysis.

STX-P18

Are Facebook Intensity and Gender Related to Self-Esteem?

***Chantel Isaac**, Undergraduate Student, College of Liberal Arts and Social Sciences*

Social media has changed the way many communicate with others besides physical contact. It has made it easy to live behind an account without any physical interaction with others. There are many positive and negative factors that contribute to ones' self-esteem. But the question is does social media help, hurt or boost the users' self-esteem. There has been previous research focusing on the relationship between Facebook usage and self-esteem and gender and self-esteem none joined both Facebook and gender. The purpose of this study is to determine whether Facebook usage or gender have any effect on self-esteem based on the information gathered from the students at the University of the Virgin Islands. A correlation study will be use to determine if Facebook intensity and gender have a relationship among college students. This research is important because it has never been done on this campus and it could bring awareness to the students on campus. The sample will consist of 100 willing UVI students from only the St. Croix Albert A. Sheen campus.

STX-P19

Students' Attitudes and Perceptions of Gangs in the St. Croix Public Schools

***Mary Josiah**, Graduate Student, College of Liberal Arts and Social Sciences*

Gangs can increase the level of violence in their immediate surroundings. Many times, gang activities in society tend to pour into schools and vice-versa. It is important to target the sources of violence and having programs to prevent and stop them in advance. This study investigates the middle and high school students' attitudes toward gangs in St Croix. Attitudes toward Gangs subscale of Attitude and Belief Assessments (Dahlberg, Toal, Swahn, &Behrens, 2005) is going to be used to collect data. The sub-scale is part of a comprehensive set of violence identification and prevention evaluations assessment tools. Study will explore the gang presence in the public schools as well as the students' perceptions of gangs in their environment. Further, these perceptions will be compared across grades and ages. Study will report the proportions of students having more accepting attitudes toward gangs. References Dahlberg, L. L., Toal, S. B., & Behrens, C. B. (Eds.). (1998). Measuring violence-related attitudes, beliefs, and behaviors among youths: A compendium of assessment tools. Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.

STX-P20

Public Opinions on the Significance of Fort Christiansvaern

***Akeem McIntosh**, Undergraduate Student, College of Liberal Arts and Social Sciences*

The Christiansted National Historic Site is one of three national parks on the island of St. Croix, US Virgin Islands. Fort Christiansvaern serves as the main feature of the Christiansted National Historic Site, hosting visitors and tourists from near and far. The purpose of this study is to determine if the regional identity of visitors of the Fort has an effect on opinions on the significance of Fort Christiansvaern. This study also aims to determine visitor appreciation of the Fort as well as visitor opinions on their knowledge of Fort before and after their visit. A quota sampling method will be used in this study. Thirty Danes, 30 U.S. Mainlanders, and 30 Virgin Islanders will be surveyed after their visit to Fort Christiansvaern. The survey is comprised of nine Likert-style questions, three open-ended questions and one regional identity question. The Likert-style questions will be analyzed using a Kruskal-Wallis test for three independent groups (regional identity). The open-ended questions will be coded and themes will be identified using a phenomenological qualitative research method.

STX-P21

Exploring the Determinants of Men's Health in the US Virgin Islands

***Michael Rosario**, Undergraduate Student, College of Liberal Arts and Social Sciences*
***Gloria Callwood**, Faculty, Caribbean Exploratory Research Center*
***Janis Valmond**, Faculty, Caribbean Exploratory Research Center*

There is a lack of research on the social and environmental determinants of men's health in the USVI. The primary aim of the study is to examine social and environmental determinants of health of USVI men in order to inform strategies to improve health outcomes and reduce health disparities affecting this population. This cross-sectional study uses a Global Concept Mapping Model that combines participation in online and in-person data collection. A convenience sampling of 100 USVI men, asking a focal prompt, will help participants identify problem areas through brainstorming, a rating-and-sorting process, and the creation of a concept map that identifies health themes. Thus far, 121 statements have been yielded from 36 men in the brainstorming phase. These statements will be sorted and rated when brainstorming closes. Subsequently, concept maps will be generated and followed by the final phase, interpretation. Global Concept Mapping has identified factors from the male perspective that enable or create barriers to obtaining health care that is culturally competent and relevant. This method is being successfully used in this qualitative study to provide a deeper understanding of the contextual health environment affecting men living in the Virgin Islands.

STX-P22

Perpetrators of Teen Dating Violence

***Berle Wallace**, Undergraduate Student, College of Liberal Arts and Social Sciences*

Research has shown that there are four predictors of teen dating violence by adolescents. Being female, being older and experiencing childhood physical and/or emotional abuse are variables linked to perpetration of teen dating violence. This study will determine if these predictor variables are also significant on the island of St. Croix. Permission has been granted to the researcher, by Wallace-Berube, for the use of data she gathered for her master's thesis that explored the link between childhood maltreatment and being a victim of teen dating violence. Students from the St. Croix School District in the USVI in grades 9-12, ranging from age 13-19, were surveyed using the Child Trauma Questionnaire (CTQ) and the Conflict in Adolescent Dating Relationship Inventory (CARDI) along with various demographic questions. Of 179 participants who took part in the survey, 146 indicated they were in relationships the year prior to the survey. I will use Wallace-Berube's data to do regression analyses of age, gender, childhood emotional abuse, and childhood physical abuse to predict abuser scores on each of the scales of the CADRI, which include adolescent physical abuse, adolescent sexual abuse, adolescent threatening behavior, adolescent relational abuse, and adolescent emotional and verbal abuse.

STX-P23

Racism: Where Do We Go From Here?

***Mary Wilder**, Faculty, College of Liberal Arts and Social Sciences*

The ENG 100 class explores the, historical, social and artistic implications of Beyoncé's music video *Formation* and the reactions and discussions in the news, on websites, and in our classroom.

STX-P24

Changes in Lionfish Prey Consumption

***Bernard II Castillo**, Faculty, College of Science and Mathematics*
***Kynoch Reale-Munroe**, Adjunct Faculty, College of Science and Mathematics*

The invasion of the Atlantic waters by the Indo-Pacific lionfish (*Pterois volitans*) 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, US Virgin Islands. Currently, the lionfish populations in the US Virgin Islands are well established and have spread down the Lesser Antilles toward South America. This study investigated potential temporal and spatial changes in prey consumption by lionfish culled from reefs surrounding St. Croix. After observing gut contents of 542 lionfish in 2011 that were collected from the west end of St. Croix and 86 lionfish from the northeast end in 2013, results indicated that lionfish preferred the same top three prey items, regardless of location.

STX-P25

Influences of Watershed inputs on Water Quality and Bioluminescent Dinoflagellates in Mangrove Lagoon, St. Croix, USVI

***Bernard II Castillo,** Faculty, College of Science and Mathematics*
***Kynoch Reale-Munroe**, Adjunct Faculty, College of Science and Mathematics*

Bioluminescent bays and lagoons, or biobays, are a rare, natural phenomenon. Mangrove Lagoon, a shallow (< 4 m) and small (3.8 ha), year-round bioluminescent lagoon is located within Salt River Bay National and Historical Park and Ecological Preserve, St. Croix, U.S. Virgin Islands. The vibrant displays of light created by an elevated abundance of the bioluminescent dinoflagellate Pyrodinium bahamense makes it a very popular eco-tourism destination for locals and tourists alike. Salt River Bay was listed on the U.S. Environmental Protection Agency (EPA) approved U.S. Virgin Islands' 2012 list of impaired waters. Listed impairments included fecal coliform bacteria and turbidity, resulting from land development, erosion, sedimentation, urban runoff and storm sewers. Correlative relationships between daily rainfall, physical water quality parameters, nutrient loading and phyto-plankton composition will provide insights into the effect of terrestrial runoff on the bioluminescent, Mangrove Lagoon.

STX-P26

Damsels and apicomplexa: new models to study parasitic diseases

***Shanan Emmanuel**, Undergraduate Student, College of Science and Mathematics*
***Andrew Campbell**, Mentor, Brown University*

Caribbean dusky damselfish, *Stegastes adustus*, are infected with hemogregarine-like apicomplexan parasites. Little is known on the mode of transmission of these parasites from fish to fish. Specifically, it is unclear if the mode of transmission is via blood-feeding crustaceans similar to *Plasmodidae* or by fecal-oral transmission like *Sarcocystidae.* We hypothesized that the hemogregarine is transmitted from host-to-host via cysts through the fecal-oral route, reminiscent of Toxoplasma infections in humans. To investigate this hypothesis we developed a protocol for isolation of cysts from fish fecal matter using Percoll step gradients, which separated the components of the fecal matter according to density. Preliminary results suggest that the parasite is transmitted through a fecal-oral pathway, because of the presence of sporulated and unporulated cysts. In addition, we developed a protocol for isolation and visualization of the infected erythrocytes from damselfish blood. Blood was also fractionated by differential centrifugation on Percoll gradients. Visualization of cells from fractionated blood employed stains including trypan blue, DAPI and pinacyanol chloride. Studies of the hemogregarine parasite can potentially serve as a good candidate model to study Toxoplasmosis in humans.

STX-P27

Differential Success of Primers on Tissue Samples Extracted from Populations of *Molossus molossus* on St. Thomas

***Villisha Gregoire**, Undergraduate Student, College of Science and Mathematics*
***Danelly Samuel**, Undergraduate student, College of Science and Mathematics*
***Semonie Rogers**, Undergraduate Student, College of Science and Mathematics*
***Hema Balkaran**, Graduate Student, Center for Marine and Environmental Studies*

Velvety free-tailed bats (*Molossus molossus*) are distributed throughout the Caribbean. The M. molossus are regarded as insectivorous species. They occupy human habitats and aid in reducing insect populations in ecosystems. The overall objective of this study is to evaluate the genetic diversity of M. molossus between populations in St. Thomas and St. John. The aim of our project was to evaluate the success of the primers on the bats' DNA samples. Tissue samples and primers were collected and tested for DNA extraction and gene amplification of specific microsatellites. To unveil which primers work best with the DNA extract, various conditions such as DNA concentrations, annealing temperatures and different primers were manipulated for the amplification of the DNA. The primers which showed the most amplification were H12, A10 and D15. We also concluded that the work strength or amplification success of the PCR could not be predicted by the DNA concentration, DNA purity, and the nucleic acid purity of the extraction. Statistical testing will be done in the future to determine the genetic diversity of the *M. molossus* on St. Thomas and St. John.

STX-P28

Antioxidant Activity in Fresh Herbs

***Genique Nicholas**, Undergraduate Student, College of Science and Mathematics*
***Ryan Shaw**, Undergraduate Student, College of Science and Mathematics*
***Brianna Scotland**, Undergraduate Student, College of Science and Mathematics*

As shown by recent research, antioxidants can be used as a technique to prevent degenerative diseases such as cancer, cardiovascular and neurological diseases. The main reason for our research is to test the antioxidant activity in some fresh herbs and to conclude which would be the best source for antioxidants. Based on previous published work by Dr. Arnao, our hypothesis is that the hydrophilic antioxidant activity (HAA) would be higher than the lipophilic antioxidant activity (LAA) in all of the fresh herbs tested. There will be 9 different herbs tested, which are sage, parsley, thyme, 2 types of oregano, basil, chives, mint, and rosemary. These plants were planted and grown specifically at the UVI Greenhouse. Antioxidants from these herbs we extracted in both an aqueous (HAA) and organic (LAA) solvents, separately. In order to determine the antioxidant activity in these herbs the ABTS/H2O2/HRP decoloration method was used and observed at 730nm using a UV-VIS spectrophotometer. The antioxidant activity was reported as Trolox equivalent per grams dry weight of fresh herbs. From the results we see that the HAA was generally higher than the LAA in the herbs. We also saw that the herb with the highest total antioxidant activity was mint (12032.13μmol Trolox Equivalent per gram dry weight) while the lowest was parsley (57.97 μmol Trolox Equivalent per gram dry weight).

STX-P29

Do Executive Function, Motivation, Stress Coping and Age Predict Academic Performance?

***Lyana Serieux**, Undergraduate Student, College of Liberal Arts and Social Sciences*

A correlation study will be conducted to see if executive functions, motivation, and stress coping skills and age are predictors of academic performance. 90 full-time and part-time undergraduate students at the University of the Virgin Islands who are at least 18 years of age will be conveniently sample. Executive function will be measured using the Applying Decision Rules subscale from the Adult Decision-Making Competence Test (Bruine de Bruin, Parker, & Fischhoff, 2007); motivation will be examined using the Academic Motivation Scale for college students (Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992), stress coping skills will be evaluated using the College Adjustment Test (Pennebaker, Colder, & Sharp, 1990). All three scales have been shown to be valid and reliable. Actual age in years will be record. Cumulative grade point average will be the operational definition of the outcome variable of academic performance and will be obtained, with the participant's approval, from the Institutional Research and Planning office. The significance of the prediction equation will be analyzed using multiple regression analysis (F-test for significance) and R2 will be used to determine the strength of the prediction.

STX P-30

St. Croix Roundtable Abstracts,
Albert A. Sheen Campus

Racism: Where Do We Go From Here?

***Mary Wilder**, Faculty, College of Liberal Arts and Social Sciences*

The ENG 100 class explores the, historical, social and artistic implications of Beyoncé's music video *Formation* and the reactions and discussions in the news, on websites, and in our classroom.

STX-R1

Collaborative action research on mathematical modeling of water quality with STEM teachers

***Celil Ekici**, Faculty, College of Science and Mathematics*
***Cigdem Alagoz**, Faculty, School of Education*
***Ann Marie Gibbs**, Staff/Student, St. Croix Educational Complex High School, Biology Department*
***Michael Henry**, Faculty, St. Croix Educational Complex High School, Physics&Math Department*
***Dianne Theophilus**, Staff, St. Croix Educational Complex High School, Mathematics Department*

Water quality presents itself as a major problem in the Virgin Islands. Since the summer of 2015, inservice mathematics and science teachers participated in professional development sessions with yearlong follow-up on the design and analysis of STEM projects around culturally responsive themes such as water quality and supply. Teachers designed Project based learning (PBL) units connecting math and science to student local experiences. An interdisciplinary collaborative action research team was formed around this theme. The yearlong support included meetings, expert visits, team teaching, and action research course towards refining and implementation of integrated math and science projects. This has been a collaborative effort between the teachers, students, and STEM Educators to design, implement and refine a cohesive interdisciplinary PBL unit aligning with math and science standards for high schools. From this ongoing effort around a culturally responsive STEM theme, we will present lessons learnt from a cycle of design and implementation incorporating student and teacher perspectives from their classroom enactments. Building on emergent and salient themes, the depth and connectedness of mathematical and scientific content and practices will be discussed with recommendation for future work.

STX-R2

St. Thomas Poster Abstracts

Program Overview: The Substance Abuse & HIV/AIDS Prevention Program

***Doris Battiste**, Staff, Caribbean Exploratory Research Center*
***Alyssa Ryan**, Staff, Caribbean Exploratory Research Center*
***Dr. Kimarie Engerman**, Faculty, College of Liberal Arts and Social Sciences*
***Shaniqua Hodge**, Undergraduate Student, College of Liberal Arts and Social Sciences*

The prevalence of substance abuse and the high rate of HIV infection in the Virgin Islands among young adults are alarming and create challenges for schools, the Health Department, the criminal justice system and the community as a whole. As such, the University of the Virgin Islands (UVI) Substance Abuse & HIV/AIDS Prevention Program was developed to reduce drug use and abuse and prevent the transmission of HIV among 18-24 year old students enrolled at the UVI and those residing in the surrounding community. The objectives of the project are to increase the number of first time HIV testers and HIV testing opportunities; decrease alcohol consumption of college students and other participants by 30% and 10% respectively; and increase awareness and knowledge by 25%. The target population consists of African American/Black and Hispanics/Latino. Through partnership with Community Based Organizations (CBOs), the program addresses community norms that serve as barriers to reducing and preventing substance abuse and the transmission of the HIV.

STT-P1

Comparing the Microbial Communities of the Coral Diseases Black Band and White Plague

***Kurt Alexander**, Graduate Student, Center for Marine and Environmental Studies*

Coral disease is now considered one of the leading threats to reefs around the world and may have contributed to the greatest loss of coral cover in the Caribbean. Black band (BBD) and white plague (WPD) disease affect a large proportion of reef building corals. These diseases are macroscopically different; however, field observations of WPD lesions becoming BBD infections suggests that BBD may be a secondary infection. This study compared the microbial communities of BBD and WPD to determine whether overlap exists that would suggest a relationship. BBD and WPD samples units were collected from reefs around the island of St. Thomas. A sample unit consisted of disease lesion margin tissue, tissue from an apparently healthy region on a diseased coral, tissue from a nearby uninfected coral, seawater from directly above the colony and sediment from nearby the colony. DNA was extracted and polymerase chain reaction (PCR) using four primers of known coral disease pathogens was performed to determine the presence/absence of the specfic bacteria within each sample type. Overlap in bacteria presence was seen within and among sites as well as between diseases. This novel study compares the communities of BBD and WPD and suggests a relationship between them.

STT-P2

Comparison of Benthic Assemblages in Native vs. Invading Seagrass Beds

***Lauren Arnold**, Undergraduate Student, Center for Marine and Environmental Studies*
***Dr. Stephen Ratchford**, Faculty, Center for Marine and Environmental Studies*
***Dr. Edwin Cruz-Rivera**, Faculty, Center for Marine and Environmental Studies*

Halophila stipulacea is a non-native seagrass, introduced into the Caribbean in 2002 from the Western Indian Ocean. It is now being recorded in many Eastern Caribbean islands, including St. Thomas, USVI. One study concluded that this invading seagrass could outcompete the native seagrasses. *Syringodium filiforme* and *Halodule wrightii* are seagrasses native to the Caribbean Sea and found in the shallow waters of Brewers Bay. The purpose of this research was to determine some impacts of this invasion by examining the possible differences in the benthic fauna in the native and invading seagrasses. We suction sampled 0.1m2 areas haphazardly in 10 native, invading and mixed seagrass beds. In the lab, the samples were thoroughly examined; the organisms and seagrasses were extracted. Major taxonomic group identified the organisms, the species identified the seagrasses, and were separated into detritus "brown" and live "green" and dry weights were taken. There was no significant difference in the number of organisms and the faunal diversity in the different seagrass habitats. Fauna included clams, crabs, shrimp, worms, fish, snails, and many more. Sampled fauna still need to be more precisely classified. The effects of *H. stipulacea* on *Thalassia testudinum*, bare sand patches and deeper areas need to be studied.

STT-P3

Effects of parasitism by the Cymothoid isopod Aniliocra chromis on its host the Brown chromis (*Chromis multillineata*)

***Jan-Alexis Barry**, Graduate Student, Center for Marine and Environmental Studies*
***Kyle Jerris**, Undergraduate Student,*
***Paul Sikkel**, Faculty, Center for Marine and Environmental Studies*
***Teresa Turner**, Faculty, Center for Marine and Environmental Studies*

The brown chromis (*Chromis multillineata*) is a common fish seen in large feeding shoals on Caribbean coral reefs. Some of them are infected with the large, conspicuous, cymothoid isopod Anilocra chromis that attach onto the operculm of the fish. Despite their conspicuousness, virtually nothing is known about the effects of *A. chromis* on *C. multilineata*. In an effort to examine potential fitness consequences to the host, both unparasitized and parasitized chromis were filmed using a GoPro camera at five different sites: Flat Cay; Brewers Bay; Coki Bay; Great Lameshur Bay; and Fortuna Bay. Video was used to quantify the prevalence of the parasite, as well as the number of pectoral fin beats and feeding bite rates for 10 parasitized and 10 unparasitized hosts (n=20) at each site. Further measures of the potential impact on host behaviour and health, such as proximity to shelter, gonad size, mate choice, and survivorship will be included in future studies.

STT-P4

Authoritative knowledge and disaster risk vulnerability: the case of wastewater, water, energy and coastal resources in the United States Virgin Islands

***Cori Bender**, Faculty, Center for Marine and Environmental Studies*
***Marilyn Brandt**, Faculty, Center for Marine and Environmental Studies*

As a United States Territory, the U.S. Virgin Islands is subject to U.S. federal government oversight for emergency preparations and environmental protection. As part of the USF NSF PIRE project focused on how human perceptions and practices related to (waste)water management impact coastal health and livelihoods in the Caribbean, the following poster discusses these perceptions and practices in the USVI, and assess disaster risk. The emphasis is on the dynamic relationship between the environment, humans and politically enforced social patterns that create coastal resource vulnerability to disaster as a result of a disconnect between authoritative and local knowledge. Additionally, this research inquires into what constitutes authoritative and local knowledge in the context of coastal resource disaster risk reduction, and the perceptions of scientific and technological approaches to wastewater, water, and energy vulnerability.

STT-P5

Evaluating the impacts of increasing sponge cover on the recovery and resilience of Caribbean corals

***Marilyn Brandt**, Faculty, Center for Marine and Environmental Studies*
***Deborah Gochfeld**, Faculty, University of Mississippi*
***Julie Olson**, Faculty, University of Alabama*
***Andia Chaves Fonnegra**, Post-doctoral Research Associate, Center for Marine and Environmental Studies*
***Lauren Olinger**, Graduate Student, Center for Marine and Environmental Studies*

Sponges are a major component of coral reef ecosystems. As coral cover has declined in response to local and regional scale stressors, sponges have increased in abundance and cover. While recent research has focused intensely on the impacts of expanding macroalgal cover on reefs, the importance of increasing sponge biomass has been largely ignored. The objective of this study was to identify the impact of space occupation by sponges on coral reef community resilience in general, and specifically in the U.S. Virgin Islands. We marked and followed sponge-coral interactions at six coral reef monitoring sites to determine the outcome of natural interactions. We also performed transplant experiments at two sites where fragments of the rope sponge *Aplysina cauliformis* were attached to colonies of *Siderastrea siderea* and monitored through time for their direct impact on coral tissue. Finally, we installed coral settlement tiles at each site of six sites with one of three treatments: living *A. cauliformis* attached (n = 8/site), skeleton of *A. cauliformis* attached (n = 8/site), blank tile (n = 4). Preliminary results from processing of settlement tiles after six months suggest that settlement tiles exhibited variety in coral recruitment rates based on treatment. Specifically, recruitment rates were higher when living sponge was not present. We anticipate that outcomes from this research will include the identification of important resilience factors in the management of reefs.

STT-P6

Swell as a high frequency driver of macroalgal cover on Caribbean coral reefs, and coral-macroalgal interactions

***Robert Brewer**, Staff, Center for Marine and Environmental Studies*
***Tanya Ramseyer**, Graduate Student, Center for Marine and Environmental Studies*
***Miguel Canals**, Faculty, University of Puerto Rico-Mayaguez*
***Jonathan Jossart**, Staff, Center for Marine and Environmental Studies*
***Tyler Smith**, Faculty, Center for Marine and Environmental Studies*

Compromised Caribbean stony coral health due to tactile interactions with reef-associated macroalgae have long been observed. The primary physical and biological components driving local macroalgal benthic cover and negative coral-macroalgal tactile interactions requires high frequency, longitudinal data collection. We used a seven-year high frequency data set (monthly) of biophysical variables, macroalgal cover, and coral-macroalgal interactions from 4 shallow (6-20 m) reefs in St. Thomas, US Virgin Islands to determine the primary factors driving intra-annual changes. We found that macroalgal benthic cover and prevalence of coral-macroalgal tactile interactions were primarily negatively related to wave driven turbulence, which likely forcibly dislodges macroalgae. Any relationships between macroalgal cover and a suite of other physical parameters including temperature, pH, sedimentation, turbidity, PAR, inorganic nutrients and chlorophyll were either minimal or influenced directly by wave turbulence. This study suggests that in coral reefs where macroalgae are or have become major benthic components, macroalgal abundance and interactions with corals can be tied to water motion. This provides another mechanism whereby moderate wind driven turbulence might favor coral health and reef growth.

STT-P7

From coral to "sponge reefs"? Excavating sponges as indicators of change

***Andia Chaves Fonnegra**, Faculty, Center for Marine and Environmental Studies*

Coral reef communities in the Caribbean and Florida have changed dramatically during the past three decades, shifting ecological phases or states. Although sponges provide habitats on reefs, destructive excavating sponges such as Cliona delitrix, also compete with, and take over space from deteriorating corals. To evaluate how much excavating sponges can take over coral reefs affected by climate change, we developed a Markov chain model based on field data obtained from 100 coral colonies in a high latitude coral reef in Florida, USA, over a period of 10 years. The model takes a multi-taxa approach in which corals, sponges, and algae are included into the analyses. The ten-year data showed an increase of C. delitrix in 2002 that was accentuated after the 2005 heat-stress related coral mass mortality event. Projections of the mean model and sensitivity analysis suggest that for the continuous survival of this coral reef, coral recruitment has to increase. When disturbance was added, macroalgae was the dominant final state on reefs in most projections. However, in case of consecutive, moderate coral mortality events, the excavating sponges could reach higher cover. Under climate change (i.e. heat stress), both corals and excavating sponges tended to decline, although sponges at a slower rate. Success or decline of excavating sponges depends of the intensity of heat stress and coral mortality events which provide the sponge with substrate.

STT-P8

The Effects of Seedling Morphology on Establishing a Red Mangrove (*Rhizophora mangle*) Nursery in a Recirculating Saltwater Table System

***Howard Forbes**, Staff, Center for Marine and Environmental Studies*

The red mangrove (*Rhizophora mangle*) is one of three true species of mangroves found growing within the Virgin Islands that provide numerous ecosystem services which include shoreline protection and providing habitat for wildlife. Although mangroves are ecologically important, within a span of 50 years, the Virgin Islands lost nearly 50% of all mangroves that used to cover its shorelines. Because of this, efforts to replant mangroves have been employed throughout the U.S. Virgin Islands; however, not all seedlings that are transplanted survive. The purpose of this project was to investigate if red mangrove seedling morphology affected survival and we hypothesized that seedlings without any physical abnormalities will have the best survival. Seedlings were collected from 5 locations on St. Thomas, USVI, grouped by their morphologies and grown inside a recirculating salt water table set-up. The health (height and number of leaves) was monitored for approximately three months. At the conclusion of this experiment, seedlings that were missing their apical bud did not grow and those that were rooted eventually died. All seedlings that did not present any morphological deformities grew without any noticeable complications. The findings of this project provide essential knowledge to the understanding of red mangrove growth.

STT-P9

Characterization of Available Hawksbill *Eretmochelys imbricata* Nesting Sites on St. Thomas, United States Virgin Islands

***Haley Goodson**, Graduate Student, Center for Marine and Environmental Studies*
***Renata Platenberg**, faculty, College of Science and Mathematics*
***Avram Primack**, Staff, GeoCAS*

Hawksbill sea turtle *Eretmochelys imbricata* populations have undergone significant declines, in large part due to loss of nesting habitats. Hawksbills are one of three sea turtle species found in the US Virgin Islands (USVI), and the primary species to nest on the beaches of St. Thomas. Their selection of beaches as nesting sites has not been thoroughly investigated. This study aims to characterize potential and selected nesting sites to better understand, and ultimately protect, Hawksbill nesting habitat. A total of 17 potential nesting beaches were monitored weekly for the presence/absence of tracks and nests. To evaluate differences between sites selected for nesting against those available but not selected, microhabitats were characterized by measuring the beach composition percentage of sand, rocks, coral, vegetation, and the vegetation species within 1-meter radius from the center of a) true nests, b) false crawls, and c) random points. Preliminary results show a pattern towards a preference for a specific species of vegetation. The results of this study will directly guide management and protection of Hawksbill nesting beaches both in the USVI and within the wider Caribbean region.

STT-P10

Physical drivers of community structure and growth among mesophotic coral ecosystems in St. Thomas, US Virgin Islands

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Mesophotic coral ecosystems (MCEs) are deep (>30m), light-dependent communities that are abundant in the northern US Virgin Islands. Compared to their shallow water counterparts, MCEs remain understudied. South of St. Thomas, mesophotic coral cover on *Orbicella*-dominated reefs can reach 50%, but observations of the northern shelf at similar depths (30-45 m) suggest limited coral cover. The cause and extent of these differences is unknown. Using spatially explicit observations of coral health and species abundances we compared northern shelf bank MCEs to well studied MCEs south of St. Thomas. Overall coral cover is lower on northern MCEs and Orbicell-dominated reefs have not been found. Factors limiting coral growth on northern MCEs may include more frequent wave disturbance as well as nutrient loading, turbidity, and thermal stress associated with upwelling. To assess if disturbance and growth are driving community structure, we collected 30 colonies each of *Orbicella franksi* and *Porites astreoides* from 27 to 47 m depths on the north and south shelves of St. Thomas. Using micro-CT to quantify calcification, we will identify environmental factors correlated with coral growth across sites. We predict slower growth rates of mesophotic corals north of St. Thomas, corresponding to lower light conditions and more frequent disturbance. These results will identify processes that influence the structure of MCEs and help to predict their global distribution and utility as refugia.

STT-P11

Complex and cryptic refugia for struggling reefs

***Daniel Holstein**, Faculty, Center for Marine and Environmental Studies*
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Climate changes are increasing disturbance to natural populations, leading to local extinctions, and compromising metapopulation persistence. Habitats that are resistant to disturbance may behave as refuges, and add resilience to metapopulations experiencing climate change. Discerning the effects of climate change on metapopulations requires modeling habitat quality as resistance to disturbance, which also allows for testing the effects of conservation effort (i.e. protection or mediation). We investigated the role of resistant refuge populations in the stability of metapopulation networks using a patch-occupancy model and reef building corals as an example. We show that in well-connected metapopulations experiencing increasing disturbance, resistant populations become dominant contributors to persistence, with an effect that decreases with declining connectivity. The interactions of connected subpopulations with diverse vulnerabilities has the potential to result in emergent metapopulation refugia. Our results suggest that networks of connected habitats that may individually experience episodic local extinction can form complex refuges that support metapopulation persistence. However, metapopulations undergoing severe habitat fragmentation may not benefit from isolated refuges, and conservation strategies focused on maintaining network connectivity (i.e. protection of highly central, well-connected populations) will more effectively mitigate extinction risk.

STT-P12

Invasion, distribution and abundance of the Indo-Pacific lionfish in the US Virgin Islands

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The Indo-Pacific lionfish (*P. volitans*) has rapidly established itself throughout the Atlantic and Caribbean region over the last decade, inhabiting a range of habitats (i.e. coral reefs, seagrass beds, mangroves) and depths. We investigated the lionfish invasion in the U.S. Virgin Islands by examining their rate of invasion, size distribution and abundance at different depths and habitats using data from USVI's long-term Territorial Coral Reef Monitoring Program (TCRMP). Lionfish were first sighted in 2008 on St. Croix and in St. Thomas in 2010 and occurred predominately in coral reef habitats. Lionfish were first detected on our TCRMP sites in St. Croix and St. Thomas in 2010 and 2011, respectively, and their presence and abundance has increased rapidly at the majority of monitoring sites. The St. Croix population seemed to reach its peak in 2011 and has remained relatively stable through 2014 whereas the lionfish population on St. Thomas and St. John has shown continued exponential growth. The majority of this population increase has occurred on mesophotic reefs >30m depth. Understanding these different population responses among islands and reef types may help to mitigate their impacts on native reef fishes.

STT-P13

Effects of invasive seagrass *Halophila stipulacea*, on abundances and species richness of juvenile fish assemblages compared to native species, *Syringodium filiforme* and *Thalassia testudinum*, in St. Thomas, USVI.

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Seagrass habitats are productive nurseries that provide ecological benefits to juvenile fish communities such as food resources and protection from predators. *Halophila stipulacea*, native to the Red Sea, invaded the western Caribbean in 2002. Research has begun to investigate impacts of this non-native seagrass on juvenile fish; however, results are not sufficiently established. In order to investigate juvenile fish abundance and species composition we conducted 24 hour trap soaks in monotypic stands of native (*Thalassia testudinum* and *Syringodium filiforme*) and non-native (*H. stipulacea*) seagrass species. To examine circadian effects we compared fish abundances and species composition with 12 hour trap soaks in monotypic stands of *H. stipulacea* and *S. filiforme*. Preliminary results from 24 hour soaks indicated significant differences in fish abundances between seagrass beds, and further analysis may confirm H. stipulacea beds support more juvenile fish than the native beds. Preliminary results from the 12 hour soaks indicated differences in fish abundance between *H. stipulacea* and the native *S. filiforme*, but this appears to be the case only when fish counts were separated by food guilds. It can be concluded that the non-native seagrass shows no negative alteration on the abundance and foraging patterns of juvenile fish.

STT-P14

Plant Identification and Use on St. Thomas, USVI: An Undergraduate Class Investigates Local Knowledge

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During Fall term 2015, an undergraduate class at the University of the Virgin Islands St. Thomas Campus was introduced to theory and methods related to the science of Ethnobotany. With this background, students carried out an Ethnobotanical Practicum to learn basic field techniques and explore the value of five local plant species to local elders, selected by the students. The five species investigated were chosen through a random process undertaken by the entire class. Following this, the class worked in teams to review literature, preserve voucher specimens, generate interview questions, select and interview elders, and analyze the data. At the end of the Fall term, the students presented to an audience of invited academics and press. We will explain how this hands-on teaching method could become a model for introducing the science of Ethnobotany to undergraduate students.

STT-P15

Effects of the parasitic isopod Gnathia marleyi on the early life history of French Grunt (*Haemulon flavolineatum*) and Beaugregory damselfish (*Stegastes leucostictus*)

***Joe Sellers**, Graduate Student, Center for Marine and Environmental Studies*

Gnathiids are the most numerous nocturnal ecto-parasites of coral reef fish found in every ocean on earth from shallow to deep-sea reef communities. Gnathia marleyi is a generalist, parasitizing nearly all coral reef fish, however, it does show preference for snappers (*Lutjanidae*) and grunts (*Haemulidae*). Gnathiids have also been shown to transmit diseases, reduce host fitness and cause mortality. Larger fish are less susceptible to gnathiid infestations due to their acquired fat reserves and shear mass. However, newly recruited fishes are small and have not yet obtained such royalties making them more likely to succumb to gnathiid infestation. Recruitment of reef fish is a major hurdle with high mortality; success is determined by a variety of factors from predation, competition, available resources, and density dependent factors. Post settlement fish require food resources and refuge from predators but to acquire each they must compete for position. Here we performed two laboratory experiments: the first compared two species of reef fish (size range: 0-50mm) the French Grunt (*Haemulon flavolineatum*) and the Beaugregory damselfish (*Stegastes leucostictus*) and their susceptibility to gnathiids; the second experiment used *S. leucostictus* to determine whether gnathiids affected its ability to compete after being parasitized.

STT-P16

The Impact of Coral Species Diversity on White Plague Disease Transmission

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***Tyler Smith**, Associate Professor Center for Marine and Environmental Studies*
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Within the past thirty years, coral diseases have devastated coral communities throughout the Caribbean. One particularly virulent disease that has been shown to cause widespread mortality as well as decreasing coral cover is white plague. Although white plague (WP) has been shown to affect 41 coral species, the role species susceptibility plays in the initiation and propagation of WP is mostly unknown (Calnan et al. 2007). Species from the *Orbicella* genus in particular have suffered substantial losses in coral cover as a result of these outbreaks and are considered susceptible to numerous coral diseases including WP. However, the dynamics behind species susceptibility to disease are poorly understood (Weil et al. 2000). Disease prevalence may be higher in abundant species since there are more hosts for infectious agents to occupy. Conversely, prevalence may be higher in species that lack morphological and immunological defenses against disease. This study compared WP disease prevalence between three susceptible and abundant coral species in the USVI (*Orbicella annularis, Siderastrea siderea* and *Porites astreoides*). Our results suggest that WP primarily affects abundant *Orbicella annularis* and Siderastrea siderea as a result of species specific traits and not overall host abundance.

STT-P17

China in the Caribbean

***Dion Phillips**, Faculty, College of Liberal Arts and Social Sciences*

China's security presence in the Caribbean began in Haiti. Its most high profile military engagement occurred in 2011 when the People's Liberation Army Navy's hospital ship visited the region with port calls in Cuba, Jamaica and Trinidad and Tobago. China limits its substantive military activity to Asia which it regards as its theatre of interest. China's diplomatic relations with ten Caribbean countries (five recognize Taiwan), which date back to 1960 when Cuba recognized Beijing, are intended to influence political decision-making on international issues - Taiwan, Tibet and to garner support against a permanent seat on the UN Security Council for Japan. Also, China's loans and investment in projects gives it political influence with the borrowing Caribbean countries as well as provides a return on its investments. In the foreseeable future, on account of the mutual benefits for the Caribbean and China, it will expand its ties resulting in a unique, strong and unprecedented footprint.

STT-P18

Brownfields

***Jhenessa Charles**, Undergraduate Student, College of Liberal Arts and Social Sciences*

In my qualitative research on brownfields, I plan to highlight important improvements that come from the renovations of brownfields. It is also important to know the central variables needed in assessing a brownfield. Therefore, there will be recent and sufficient census data to be the foundation of my project. A brownfield is defined as a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Using a mile-long buffer on my research map, the individuals that are within that radius are the subjects of the variables. Household income, and level of poverty are key variables in order to assess a brownfield. Are brownfields centered in areas where middle-low income families reside? Completing and clarifying this research of brownfields will help to answer this question and many more.

STT-P19

Pathways to Success Co. - Restaurant Review

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***Zoe Walker**, Undergraduate Student, College of Liberal Arts and Social Sciences*
***Augustus Laurencin Jr.**, Undergraduate Student, College of Liberal Arts and Social Sciences*

The Pathways to Success Co. was founded in 2016 by the members of the Public Relations Campaign Development class of Spring 2016 at the University of the Virgin Islands. We are a class-based company who believe that a consulting voice is needed to help assist a local business on St. Croix with the keys to successful publicity. For the purpose of respecting our client's confidentiality, we have chosen to use the pseudonym "Restaurant X" for this project. We conducted physical surveys outside of their venue to gauge patrons' overall satisfaction at their establishment. We then analyzed our data and presented our client with suggestions to improve the overall satisfactions of patrons.

STT-P20

Public's Attitude Towards the Mentally Ill

***Tarriesha Dawson**, Undergraduate Student, College of Liberal Arts and Social Sciences*

Traditionally, mental illness has neither been well understood nor tolerated by the general public. As a result, attitudes of stigmatization and discrimination towards the mentally ill have become prevalent in society. It may take radical endeavors to influence change in societal mindsets and even governmental policies to combat this intolerance. This research will assess British Virgin Islanders' knowledge and attitudes towards mental illness, through a survey administered to a convenience sample of 100 members of the public who are 18 years and older. The surveys will be self-reported and completed anonymously. I hypothesized that the results will reveal low knowledge scores but high scores for attitudes that are unsympathetic towards the mentally ill. Further, it is unlikely that this problem is unique to the British Virgin Islands as literature has reported such findings. Research which evaluated the public's attitudes towards the mentally ill in England and Scotland revealed that attitudes had deteriorated between 1994 and 2003 (www.bjp.rcpsych.org). Currently, no study exists on the BVI public's attitude towards the mentally ill. It is hoped that this research will lead to greater awareness of the stigma of mental illness and stakeholders' implementation of programs useful in combating the stigma.

STT-P21

Students at the University of the Virgin Islands and Their Awareness of Crime Within the St. Thomas Community

***Cierra Joshua**, Undergraduate Student, College of Liberal Arts and Social Sciences*

The purpose of this study is to explore the relationship between students at the University of the Virgin Islands and their awareness of crime within the community in which the university is located. The crime of interest is murders or homicides. No one should be excluded from paying attention to issues within his/her community, particularly the issue of crime- not even someone who is just a visitor; certainly not persons enrolled in institutions of higher learning within that community. Not only because it is part of the student's social responsibility but because they stand to become the decision- and policy-makers and problem-solvers of tomorrow.

STT-P22

Using GIS to Improve Agriculture in the U.S. Virgin Islands: From Brown to Green

Kilyn La Plante, *Undergraduate Student, College of Liberal Arts and Social Sciences*

Farmers in the U.S. Virgin Islands face many challenges, one of which is locating soil that is suitable for farming. This issue can be fixed using Geographic Information System (GIS). GIS, also known as Geospatial Information System, is a computer software and hardware system that enables users to capture, store, analyze, and manage spatially referenced data. GIS allows us to create a summarized view about the land's characteristics. This pro-active approach reduces some of the risk and confounding variables common to agriculture. Agriculture is the science or practice of farming, including cultivation of the soil for the growing of crops and the rearing of animals to provide food, wool, and other products. The aim of this study is to (i) create a thematic map that surveys the soil characteristics and identifies soil fertility; (ii) create awareness among farmers, which would improve agriculture in the U.S. Virgin Islands. The data used would be obtained from the Natural Resources Conservation Service Soils (NRCS).

STT-P23

Generations and the Increase of Technology Use

Brittane Peter*, Undergraduate Student, College of Liberal Arts and Social Sciences*
Steven Schwartz*, Staff, College of Liberal Arts and Social Sciences*

For the past few years, there has been a dramatic increase with the creation of digital technology. Items ranging from smartphones, computers, tablets, and fitness devices have all affected society in different ways. Some of the newly generated devices have created an increase in health along with the flexibility to get numerous tasks completed. As a result of the dramatic increase with technology, researchers have developed a strong interest in determining if there is a relationship between younger generations being more interested with digital devices compared to an older generation. In a recent survey administered to 1,448 people, researchers found that people within the Generation X category were more comfortable with the use of digital technology compared to the Millennial Generation. The Traditional Generation had an outcome that was close to the expected results. It was founded that Generation X had more people feeling comfortable with the use of newer technology compared to the Millennial Generation. After reviewing some statistics, it was determined that more people within the Generation X category had downloaded or purchased an item to help manage their health. This information encourages researchers to analyse why the Generation X has higher level compared to the Millennial Generation.

STT-P24

Domestic Violence in the Virgin Islands

***Naji Shadeed**, Undergraduate Student, College of Liberal Arts and Social Sciences*
***William Harrigan**, Undergraduate Student, College of Liberal Arts and Social Sciences*

Domestic violence has been a growing issue in the Virgin Islands. Non-profit organizations like the Family Resource Center (FRC) provide services to victims of crime in the Virgin Islands. While they tend to victims of all crime, they pay close attention to domestic violence. In the project, we will be collecting and analyzing data on behalf of the FRC. The goal of this research project is to see what UVI students think and know about domestic violence in the territory. The research methods being used to acquire this data are: quantitative and qualitative methods. The quantitative data was collected via an online survey tool known as Survey Monkey by means of a random sample. 50 students were randomly selected to fill out a survey containing 10 closed-ended questions ranging from their charity to domestic violence. The qualitative data was collected through a series of interviews. 11 UVI students were asked 7 open-ended questions about how they felt about domestic violence and charity. While we assumed most UVI students have little or no experience with domestic violence, the results indicate otherwise. Domestic violence will remain prevalent in the territory unless it is properly addressed.

STT-P25

A Child's Household and Perception of Society

***Mavrvelous Utibe**, Undergraduate Student, College of Liberal Arts and Social Sciences*

Recent years have brought about key changes in numerous households of various societies. The traditional household with a heterosexual, married couple raising children is gradually changing from being considered the norm. With the awareness of the changing dynamics in family structure, this research will investigate how others perceive the children coming from different backgrounds in relation to their ability to adjust into society. For this research experiment, through the method of cluster sampling, there will be a distribution of 100 survey questionaires to willing participants from different areas in the St. Thomas community such as parking lots, parks, shopping centers, and neighborhood settings. The survey will be measuring the Virgin Islands' attitudes about a child's predicted adjustment into society based on their parent's household's socioeconomic status, sexual orientation, and marital status of the parents. Additionally, the three independent variables in this study are all binary nominal (ex: low/high SES, married/divorced, straight/gay), therefore the utilization of the 2 x 2 x 2 within subjects experiment as the research design will be operated while analyzed with ANOVA's 2x2x2 Between Subjects Factorial in SPSS. Ultimately, this study can assist in the pursuits in understanding the best conditions for the upbringing of children here in the Virgin Island that ensures successful adulthood.

STT-P26

The genetic diversity of the velvety free-tailed bat, *Molossus molossus* between populations on St. John and St. Thomas and between populations on St. Thomas

***Hema Balkaran**, Graduate Student, College of Science and Mathematics*
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Bats are the only native terrestrial mammals in the United States Virgin Islands and they serve major ecological and economical roles in ecosystems. The velvety free-tailed bat, the only insect eating bat of the five bats species in the USVI, was sampled for tissue samples from two populations on St. Thomas and from one population on St. John. Polymerase chain reactions (PCRs) were carried out with their DNA extractions using different primers and the PCR products are being analyzed. In the results, I expect to see a genetic structure difference between St. Thomas and St. John. I also expect to find a little variation in the genetic structure from the two populations within St. Thomas. This study will help explain whether these two islands represent two different populations or if they are one interbreeding population. This information is critical for the informed management of this endemic mammal of the Virgin Islands. We will not want to lose any populations with unique genetic structure and therefore this study will help to inform us of the extent of the varying genetic structure of *M. molossus*.

STT-P27

Gb3 Expression on Human Cervical Cancer Cells and Effects of Shiga Toxin-2

***Annalyn Brown**, Undergraduate Student, College of Science and Mathematics*

Bacterial infections caused by enterohemorrhagic E.coli (EHEC) can lead to the development of hemolytic uremic syndrome (HUS) which may be fatal. In order to treat those suffering from this infectious disease, the effects of these bacteria must be studied in vitro before they can be monitored in animal models. Human epithelial cervical cancer cells (HeLa) were challenged with the Shiga toxin type 2 produced by these bacteria to evaluate effects on cell viability. Cells also were incubated with antibodies to determine Gb3 expression (CD77), the receptor on cell surfaces that binds the toxin, by flow cytometry. We hypothesize that HeLa cells would exhibit Gb3 receptors on their cell surfaces as well as be susceptible to the toxin. HeLa cells expressed Gb3 on their cell surfaces and qPCR was used to quantify mRNA for alpha- galatosidase, an enzyme important for Gb3 synthesis. HeLa cell sensitivity to Shiga toxin type 2 could not be determined due to inconclusive results. Further tests would need to be performed to obtain reproducible results for HeLa cell sensitivity to Shiga toxins. Understanding the receptor expression and toxin sensitivity relationships in different cell types contribute insight into the pathophysiology of the bacterial toxins. This work was funded by UVI MARC 5T34GM008422 and NIH/NIAID R25HL118693.

STT-P28

Identifying Intrinsic Resistance in *Pseudomonas aeruginosa*

***Nirisha Commodore**, Undergraduate Student, College of Science and Mathematics*

The opportunistic bacterial pathogen, *Pseudomonas aeruginosa*, displays intrinsic resistance to multiple classes of antibiotics, and can readily acquire resistance to antibiotics used in clinical practice. We propose to identify genes that underlie mechanisms of intrinsic resistance by detecting those required for fitness in the presence of antibiotics. To this end, a mutant library of *Pseudomonas aeruginosa* (PA14) was generated by random transposon mutagenesis. Insertion sequencing (InSeq) was performed on two library replicates to identify genes disrupted by transposon insertions. Our results showed that transposon insertions were well dispersed throughout the genome with approximately one insertion every 100 base pairs. Approximately 5,000 nonessential genes were disrupted and genes lacking insertions correlated to previously identified essential genes. The mutant library will be grown in sub-microbicidal concentrations of antibiotics which represent classes of drugs that are both effective and non-effective in treating *Pseudomonas* infections. The output population will be sequenced and the abundance of transposon insertions between the original mutant library and the post-experiment population will be compared to identify disrupted genes that contribute to fitness in antibiotic conditions. Identification of genes involved in these intrinsic resistance mechanisms may provide new targets for the development of antibacterial drug treatments.

STT-P29

Vibrational Scaling Factors for Transition Metal Carbonyls

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Metal carbonyls are used in metal purification, homogeneous catalysis, polymerization chemistry, and drug development. Recently, metal carbonyl complexes have been studied in the gas phase with mass spectrometry and infrared laser photodissociation spectroscopy. Density Functional Theory (DFT) is often used to assign structures and aid in the interpretation of the experimental data. Spectra obtained from gas-phase experiments on neutrals and ions are ideal for such comparisons to theory. However, since vibrational frequencies calculated via DFT are harmonic, theoretical spectra do not perfectly coincide with experimental values. As a result, scaling factors are calculated to account for anharmonicity. To obtain reliable and unbiased vibrational scaling factors for metal carbonyl systems, scaling factors for different functional/basis set combinations were calculated using DFT. Calculations were conducted on 20 metal carbonyl complexes using the Gaussian 09 program. Three basis sets: LanL2DZ, LanL2TZ, and Def2-TZVP were used for each of the four functionals: B3LYP, BP86, M06, and M06L. Scaling factors were implemented in all theoretical spectra for each basis set/functional combination which showed agreement between theoretical and experimental bands. Future work includes the utility of this level of theory and computational method with other metal-ligand complexes such as metal-acetylene, metal-ethylene, and metal-water.

STT-P30

Overview of Malware Attack Steps: The Kill Chain Model

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Malware, also known as Malicious Software, is a general term used for software created to do harm to users and their computers. Malware can be categorized based on their functions and how they they infect computers. Examples of well-known categories are viruses, worms, Trojans, spyware, and rootkits. These malicious software uses security vulnerabilities to penetrate the defenses of the user's computer. Most common ways for a user's computer to become infected with malware is by visiting legitimate websites that were hacked and compromised, unknowingly downloading malware. Another is clicking on suspicious email links or downloading attachments. Spyware gather information on the user, email addresses, passwords, websites visited, and forwards it to the creator or another party. Spyware can also take up a lot of computer resources, causing the computer to be slow, freeze, or even crash. Botnets are networks of computers infected with malware and controlled remotely. The "zombie" computers are used to perform multiple tasks, like attacking websites, spreading email spam, etc. In order to analyze the steps of a cyber attacks, Lockeed Martin introduced the Cyber Kill Chain model. Basically this model consists of seven steps: reconnaissance, weaponization, delivery, exploitation, installation, command and control and Action on Objectives. In this study each step is described and exemplified in the context of spyware and botnets.

STT-P31

Brine Shrimp Cytotoxicity Studies of a Mixture of Lemongrass and Ginger Oil

***Jonique George**, Undergraduate Student, College of Science and Mathematics*

Lemongrass is a multi-medicinal plant. In its crude form, it has multiple benefits including antimicrobial, antiseptic, anti-inflammatory, and astringent. HPLC analysis of the purchased "NOW Essential Oils 100% pure lemongrass oil" shows that the main ingredient is Citral (composed of geranial and neral), which correlates with the literature. We made various mixtures of lemongrass and ginger oil in an attempt to optimize the potency of lemongrass oil. Potency was determined through cytotoxicity brine shrimp assays, indicated by the calculated LD50 (lethal dosage kills 50%). Mixtures with LC50 values lower than 1000 ug/mL might be good candidates for further bioanalytical studies as future medicine.

STT-P32

Modification and Improvement of Existing General Chemistry Labs using Microlab™ Data Acquisition Systems

***Denine Hurtault**, Undergraduate Student, College of Science and Mathematics*
***Jamisha Francis**, Undergraduate Student, College of Science and Mathematics*
***Shanaliz Natta**, Undergraduate Student, College of Science and Mathematics*

Two of the most useful types of experiments that can help emphasize to students lecture concepts are titrations and calorimetry. Recently, the Department of Chemical and Physical Sciences at UVI (St. Thomas) has purchased eight MicroLab™ data acquisition stations and the associated sensors that can be used to perform a variety of different experiments, including titrations and precise temperature measurements. We have successfully modified three types of experiments (acid-base titration, redox titration, and specific heat determination) currently part of our existing curriculum such that they can be performed using MicroLab™ systems. The results include standardization of reagents, experimental determination of unknowns, and statistical analysis of the data. In particular, the results demonstrate no statistical difference between different dropper tips, and no statistical difference in the calibration of droppers and rate of reagent addition for the titration results. Future work will include adapting more laboratories to be used with these systems and begin to use these systems in other courses in the curriculum (e.g. analytical and physical chemistry).

STT-P33

3D printing a 6MW offshore turbine

***Sherika Jacobs**, Undergraduate Student, College of Science and Mathematics*

Three-dimensional (3D) printing is being used widely today as a means of being cost effective and time efficient to produce (3D) solid items from digital files. The research conducted focused on answering this question: Can prototyping a 6 megawatt (MW) offshore turbine using a 3D printer function realistically in order to complete various reduced-scale experimental tests on the model? The 3D printer is limited to using specific materials such as plastic, steel, wax, silver, etc. Polyatic Acid Plastic (PLA) will be used to print the turbine. The most important factor that must be considered in this experiment is the dimensions of the turbine. Froude Scaling (100:1) will be used to scale down the turbine. The turbine will first be modeled in Tinker-Cad and printed using a Makerbot®, which is limited to using PLA or Acrylonitrile Butadiene Styrene (ABS) plastic to print and maximum dimensions of 11.2” x 10.6” x 9.06”. As a method of overcoming this obstacle, connections will be made in Tinkercad so the turbine can be printed in various segments and connected after printing. Future experiments will be conducted to determine the operative viability of the archetype 6MW offshore turbine.

STT-P34

Application of the Dynamic Programming Principle to Pairwise Sequence Alignment

***Gejae Jeffers**, Undergraduate Student, College of Science and Mathematics*
***Marc Boumedine**, Faculty, College of Science and Mathematics*

Sequence alignment procedure compares two or more biological sequences (whether DNA, RNA, or protein) in order to infer whether the sequences are homologous. With this information, researchers are able to conclude about a common evolutionary history within sequence molecularly, and species biologically. Two categories of alignment can be computed: local and global alignments. Local alignment attempts to match subsequences of the given sequences. Global alignment tries to match the full length of the sequences. A variety of computational algorithms have been applied to the sequence alignment problem. In order to determine how close sequences are aligned, various similarity measurements can be applied. Common approaches such as Hamming and Levenshstein distances. However these metrics are not suitability for application to molecular biology given that certain changes will likely occur more frequently than others. To measure the relative probability of changes PAM (Percent Accepted Mutation) substitution matrices have been introduced. Dynamic programming principles can be applied to numerous applications, such as determining the cheapest cost in time, shortest path, binary search and more. This work presents an application of dynamic programming to pairwise alignment using various scoring schemes. The Needleman-Wunsch algorithm is presented and results of pairwise alignment of various scoring schemes are presented and discussed.

STT-P35

The West Indian Sea Egg (*Tripneustes ventricosus*) is negatively impacted by the invasive seagrass *Halophila stipulacea*

***Kyle Jerris**, Undergraduate Student, College of Science and Mathematics*

One of the most prominent seagrass grazers in the Caribbean, the West Indian Sea Egg (*Tripneustes ventricosus*), seemed to be a prime candidate to control a recent invasion of the Indian Ocean seagrass *Halophila stipulacea*. This study, conducted on St. Thomas, United States Virgin Islands, aimed to determine whether *Tripneustes* can act as a biological control for *Halophila* as well as what effects this seagrass might have on the urchin. Surveys were conducted to determine habitat preference. These surveys showed that these urchins had a reduced preference towards *Halophila* beds. A multi choice feeding experiment was then conducted to determine preference among the local seagrass species. The experiment showed that *H. stipulacea* was among the least preferred. To further determine if the West Indian Sea Egg would be a suitable biocontrol for *H. stipulacea*, urchins were fed either *Halophila* or the native seagrass *Thalassia* for five weeks. During this experiment, we observed the urchins' righting behavior. The majority of the *Halophila* treatment urchins exhibited an abnormal dropping behavior when righting themselves, suggesting that they have poor health on this food. Thus *Tripneustes* probably cannot control *Halophila* and indeed its population and its fishery might be negatively impacted by the invasion.

STT-P36

Cytoxicity Studies of Ginger Oil doped with Lemongrass Oil using a Brine Shrimp Assay

Lorne Joseph, *Undergraduate Student, College of Science and Mathematics*
Nakeshma Cassell, *Undergraduate Student, College of Science and Mathematics*

The aromatic ginger root (*Zingiber officinale*) is historically known for its medicinal benefits as a remedy for many ailments which include: nausea, indigestion, and prevention of blood clots. In addition to these, ginger has been reported to exhibit antifungal, anti-inflammatory and antimutagenic properties. Based on literature, these benefits can be attributed to its chemical composition. "Now Essential Ginger Oil" was purchased from a local natural food store and its chemical composition was determined via HPLC (High Performance Liquid Chromatography). Furthermore, its LD50 was determined using a Brine Shrimp Assay. Since lemongrass oil also exhibits multiple medicinal benefits, various cocktails of ginger oil doped with lemongrass oil were subjected to the cytotoxicity assay. The LD50s were compared to investigate how the doping affects the potency of ginger oil.

STT-P37

The Effect of Rk35 Anti-Myostatin on Muscle Growth and Neurotrophic Factor Expression in Heart Tissue and Cardiac Muscle Cells in Culture

Serena Joseph*, Undergraduate Student, College of Science and Mathematics*
John-Mary Vianney*, Graduate Student, Western Michigan University/Neuroscience*
John Spitsbergen*, Faculty, Western Michigan University/Neuroscience*

Myostatin (GDF-8) is a growth factor protein that limits muscle growth. This complex protein is usually expressed in skeletal muscles, but also in cardiac muscle. Blocking myostatin over a two week period, results in an increase in muscle mass in mouse models. In human and animal models, the aging process increases muscular atrophy that is linked with heart failure. A moderate amount of myostatin has shown to lower the risk of cardiac hypertrophy and cardiac fibrotic cyst that is also linked to pulmonary hypertension. Glial cell line derived neurotrophic factor (GDNF) is a critical neurotrophic factor that sustains nerve development and growth in skeletal muscle. GDNF is commonly expressed in embryo hearts, but not in adult hearts. It is possible GDNF increase cardiac sympathetic innervation. The main objective of the current study is to understand how anti-myostatin affects GDNF in cardiac muscle with the absence of exercise. The long term aim of this study is to provide clarity on how to reduce the risk of various fatal cardiac diseases.

STT-P38

Determination of the prevalence of Open-Angle Glaucoma (OAG) in the US Virgin Islands population

***Verleen McSween**, Faculty, College of Science and Mathematics*
***Rawle Watkins**, UVI Student, College of Science and Mathematics*

Glaucoma is one of the leading causes of vision loss world-wide. This disease leads to irreversible vision loss by selective death of retinal ganglion cells in the human retina. The prevalence of glaucoma is known to increase with age. Other risk factors include a family history of glaucoma and being of African descent. However, relatively few studies have been done on predominantly black populations to assess the prevalence of glaucoma and risk factors that may increase one's susceptibility to this debilitating disease in such a high-risk population. Additionally, studies that have been done on black populations indicate that Caribbean populations may have higher rates of glaucoma than their black counterparts within the continental United States. The main objective of the current study will be to generate preliminary data on the prevalence of open-angle glaucoma (OAG) in the aging population of the US Virgin Islands. The relationship of the prevalence of OAG to race or ethnicity, age, and gender will also be considered. A better assessment of the occurrence of open-angle glaucoma in the present US Virgin Islands population may lead to more effective patient intervention and earlier diagnosis of glaucoma as the aging population in the US Virgin Islands continues to increase. These findings aim to improve patient quality of life for local Virgin Islands residents who may have increased susceptibility to developing glaucoma over time.

STT-P39

Elysia crispata, the solar powered lettuce sea slug, prefers to associate with the filamentous green alga *Bryopsis plumosa* versus the calcified green alga *Penicillus lamourouxii*

***Zola Roper**, Undergraduate Student, College of Science and Mathematics*

Elysia crispata is a common herbivorous benthic marine invertebrate known as the lettuce sea slug studied because it has the unusual ability to sequester chloroplast from algal cells and utilize them for energy and coloration. These sequestered chloroplasts are taken up by the digestive diverticula. This slug is a sacoglossan species that feeds on green macroalgae by scraping through their cell walls and ingesting the internal cytoplasm. A previous study done by Pierce et al. found that *Elysia crispata* from St. Thomas USVI contained chloroplast from *Penicillus* and not *Bryopsis*. I hypothesized that there would be a difference in which algae slugs prefer to associate with, comparing the two different green algae (*Bryopsis plumosa* and *Penicillus lamourouxii*). This experiment is ongoing because the slugs are not very abundant in the winter. Slugs are collected and placed in flow-through plastic containers where they are given the choice of either green alga. While in the containers, they are recorded using video surveillance to observe their activity within a six-hour period. Thus far, specimens are seen to be more active on the *Bryopsis* whether they are on the algae itself or feeding on it. This result suggests that *Elysia crispata* associates more with *Bryopsis*, despite what other studies have shown about chloroplast retention.

STT-P40

Differential Success of Primers on Tissue Samples Extracted from Populations of *Molossus molossus* on St. Thomas

***Danelly Samuel**, Undergraduate Student, College of Science and Mathematics*
***Villisha Gregoire**, Undergraduate student, College of Science and Mathematics*
***Semonie Rogers**, Undergraduate Student, College of Science and Mathematics*
***Hema Balkaran**, Graduate Student, Center for Marine and Environmental Studies*

Velvety free-tailed bats (*Molossus molossus*) are distributed throughout the Caribbean. The *M. molossus* are regarded as insectivorous species. They occupy human habitats and aid in reducing insect populations in ecosystems. The overall objective of this study is to evaluate the genetic diversity of M. molossus between populations in St. Thomas and St. John. The aim of our project was to evaluate the success of the primers on the bats' DNA samples. Tissue samples and primers were collected and tested for DNA extraction and gene amplification of specific microsatellites. To unveil which primers work best with the DNA extract, various conditions such as DNA concentrations, annealing temperatures and different primers were manipulated for the amplification of the DNA. The primers which showed the most amplification were H12, A10 and D15. We also concluded that the work strength or amplification success of the PCR could not be predicted by the DNA concentration, DNA purity, and the nucleic acid purity of the extraction. Statistical testing will be done in the future to determine the genetic diversity of the *M. molossus* on St. Thomas and St. John.

STT-P41

UVI's Mathematics Behind the Science Summer Program

***Aimee Sanchez**, Staff, College of Science and Mathematics*
***Robert Stolz**, Faculty, College of Science and Mathematics*

The Mathematics Behind the Science (MBS) Summer Program seeks to provide a strong mathematics foundation for incoming students and increase students' understanding of and interest in computation, leading to more students taking computer science early in their college career. Students are recruited from the pool of declared STEM majors who have been accepted to UVI. MBS includes four major components: (i) pre-calculus or algebra component with a workshop approach; (ii) scientific reading and writing; (iii) introduction to computing; and (iv) STEM Freshman Development Seminar (FDS)—How to be successful in STEM, with integration of growth mindset curriculum. The program resulted in the majority of students being placed in college level Calculus courses at the beginning of the Fall Session. We will discuss the format of the program, the curriculum and the outcomes.

STT-P42

Peer Led Team Learning in Foundation Mathematics for College Students: An Approach to Retention

***Aimee Sanchez**, Staff, College of Science and Mathematics*
***Robert Stolz**, Faculty, College of Science and Mathematics*

The University of the Virgin Islands is an open enrollment institution where approximately 70% of the incoming freshman students place into one of two zero-credit pre-algebra courses. Peer Led Team Learning (PLTL) was implemented in these courses in order to impact pass rates, student retention and persistence. A preliminary pilot implemented during year one of this project for STEM majors showed an increased pass rate. This led to a University-wide adoption of the approach for all developmental mathematics courses. This presentation will give an overview of the implementation, including curricular materials, and present data showing increased pass rates in those courses.

STT-P43

Antioxidant Activity in local Algae

***Brianna Scotland**, Undergraduate Student, College of Science and Mathematics*
***Genique Nicholas**, Undergraduate Student, College of Science and Mathematics*
***Ryan Shaw**, Undergraduate Student, College of Science and Mathematics*

Antioxidants provide many benefits to the human body. They protect the cells against damages caused by oxidation reactions. Antioxidants act as a reducing agent that stops oxidation, which cause free radicals. Prevention of cancer, heart diseases and aging signs are just some benefits of antioxidants. Antioxidants can be found in varieties of foods such vegetables, fruits and algae. The objectives of this experiment were to: 1) determine the antioxidant activity in local algae and 2) correlate the macroalgae phyla with antioxidant activity. Our hypothesis was that the algae within the phylum *Phaetophyta* would have the higher total antioxidant activity than the algae within the phyla *Rhodophyta* and *Chlorophyta*. The methodology used to determine the antioxidant activity was the ABTS/H2O2/HRP decoloration assay. The drop in absorbance was scanned in UV-VIS spectrophotometer at 730 nm. The antioxidant activity was reported as µmole Trolox Equivalent (TE) per gram dry weight for algae. *Codium isthmocladum* (*Chlorophyta*) had the highest total antioxidant activity (872.96 µmol TE per gram dry weight), relative to all samples. *Penicillus capitatus* (*Chlorophyta*) had the lowest total antioxidant activity (56.79 µmol TE per gram dry weight). In conclusion, antioxidant activity was found in the six local algae and *Phaetophyta* did not have the highest antioxidant activity. This research was funded by NSF HBCU-UP Grant #1137472.

STT-P44

Antioxidant Activity in *Hibiscus Sabdariffa*

***Ryan Shaw**, Undergraduate Student, College of Science and Mathematics*
***Genique Nicholas**, Undergraduate Student, College of Science and Mathematics*
***Brianna Scotland**, Undergrad Student, College of Science and Mathematics*

Antioxidants are substances that are believed to prevent the destructive unwanted oxidation of substances in a cell. Research shows that antioxidants play a role in the prevention of multiple degenerative and neurological diseases. Antioxidants are found in fruits and in plants. Sorrel (*Hibiscus sabdariffa*) is a tropical plant that produces a red fleshy calyx that is used to create a local drink in the U.S. Virgin Islands. Sorrel is known to be a rich source of anthocyanin. We hypothesized that the darker coloured sorrel samples would have a higher Total Antioxidant Activity (TAA) compared to lighter coloured sorrel. Seven different sorrel samples were used in this study, which were grown at the University of the Virgin Islands. Antioxidants were extracted separately in aqueous phosphate buffer solution and in ethyl acetate. We used the azino-bis-(3-ethylbenzthiazoline-6-sulfonic acid/H2O2/horseradish peroxidase (ABTS/ H2O2/HRP) decolouration method to determine the TAA. The samples were monitored at 730 nm in a UV-VIS Spectrophotometer over the course of 5 minutes. Our results showed that in general, the Hydrophilic Antioxidant Activity (HAA) of all the sorrel samples tested were significantly higher than the Lipophilic Antioxidant Activity (LAA). Sorrel sample (DWx100)xK had the highest TAA and sample 245xK R23P13 had the lowest TAA. In conclusion, *Hibiscus sabdariffa* was judged as a significant source of antioxidants.

STT-P45

Evaluating Intrusion Detection Classifiers: A Data Mining Approach

***Denny Smith**, Undergraduate Student, College of Science and Mathematics*
***Marc Boumedine**, Faculty (mentor), College of Science and Mathematic*s

Attacks on network systems have increased dramatically. In order to cope with this trend, it is imperative to enhance existing intrusion detection system (IDS) to secure critical infrastructures. In order to analyze a large volume of security audit data it is necessary to design and evaluate fast algorithms that can determine if network activities are classified as ‘normal’ or ‘attack’. This study will compare results from two classifiers for different classes of attack. Experimental data sets from the KDD (Knowledge Discovery in Databases) Cup 1999 Data have been retrieved to perform the sufficient experiments. Throughout the experiments, we used the LMT decision tree algorithm and the J48 decision tree algorithm to compare correctly classified attacks. Based on our results, LMT decision tree performs slightly better with 96.66 % correctly classified instances.

STT-P46

Analysis of the time spent feeding and moving by the lettuce sea slug

***Ashley Thomas**, Undergraduate Student, College of Science and Mathematics*

The lettuce sea slug, *Elysia crispata*, is a sacoglossan (sap-sucking) sea slug that steals chloroplasts from the algae on which it feeds; these chloroplasts continue to photosynthesize within the body of the slug. The movement and feeding behavior of this organism (which also can get energy from sunlight due to the stolen chloroplasts) was studied using time-lapse video recording of the slugs in 18x17x6cm trays for a twenty-four hour period. The amount of time spent moving, being still and being still on algae was measured. The species of algae included *Bryopsis pennata, Caulerpa racemosa*, and *Udotea flabellum*. Some slugs were given one species of algae, all three species or no algae at all. At least 7 replicates of each treatment were successfully completed. The majority of the slugs, despite their treatment, spent very little time moving. The slugs in algal treatments spent marginally less time moving at night than during the day and early evening. Except for one sluggish slug, the slugs spent far more time on *Bryopsis* than on the other algae. Starved slugs spent no more/less time moving than slugs with algae. The experimental results could be challenged since we used a weak light at night to videotape the slugs. Much of the work supports the conclusions from research of UVI graduate student Ariel Hawkins.

STT-P47

Examining Genome Differentiation of Old and New World *Anas Platyrhyncos*

***Krislen Tison**, Undergraduate Student, College of Science and Mathematics*

Mallard ducks (*Anas platyrhnchos*) are a Holarctic species with a distribution ranging between the Arctic Circle and the Tropic of Cancer. These ducks are capable of migrating long distances in both North America and Eurasia. The objective of this study was to test for significant differentiation between North American and Eurasian mallards. A pseudo-random sampling of 3,710 independent nuclear markers were isolated using a double-digest restriction-associated DNA sequencing (ddRAD-seq) protocol for 27 New World (NW) and 23 Old World (OW) mallards, and 1 mallard from Laysan Island off the Hawaiian archipelago. Although OW and NW mallards showed overall low differentiation (overall Fst = 0.02), principle component analyses (PCA) revealed that 95% of the samples from both OW and NW do not completely overlap. Fst distributions of ddRAD-seq markers showed a exponential decrease with the highest estimates reaching an Fst of 0.33. These results suggest that population structure between NW and OW mallards is likely the result of genetic drift, rather than selection. Our findings are in contrast to previous work that suggested no structure in mallard ducks. Moreover, given that mallards are carriers of avian influenza, this research has the potential to shed light into geographical pathways of avian influenza transmission.

STT-P48

Developing a Test Stand for Lifetime Measurements using a Narrow Gap Detector

***Omani Tuitt**, Undergraduate Student, College of Science and Mathematics*

The University of the Virgin Islands (UVI) recently won a proposal in collaboration with NASA Goddard Space Flight Center (GSFC) that included building a detector life-test chamber at UVI to support the degree program as well as assist NASA by running tests on detector components and reporting the results. The team at GSFC is developing X-ray polarimeters that can be used in detecting and imaging astrophysical sources such as black holes and neutron stars. The purpose of our research is to understand the effects that the degradation of gas has on the performance of the detectors. The current generation of time projection polarimeter incorporates a narrow gap detector assembled with epoxy. The addition of the epoxy allows a smaller gap with the minimal amount of changes from the original design, enhancing the performance of the detectors. With the use of epoxy, lifetime measurements have to be made to see how the epoxy detectors compared to previous iterations. We have been studying the effects on the narrow gap detector in the Mahaffey chamber in order to determine whether the epoxy affects the cleanliness of the gas. Tests have been conducted with a residual gas analyzer (RGA) in order to monitor the cleanliness of the gas inside of the Mahaffey chamber while being baked out. Results show that the detector is in fact getting cleaner as time progresses. The plan is to create minimal degradation that will last at least two years.

STT-P49

Coral Disease Dispersion: A Mathematical Investigation

***Elangeni Yabba**, Undergraduate Student, College of Science and Mathematics*
***Ariane Ramsundar**, Undergraduate Student, College of Science and Mathematics*

Coral reefs are in global decline and deteriorating at alarming rates, with coral diseases increasing both in prevalence and in space. We are analyzing and modeling data from NOAA and the Marine Science Center that documents information on salinity, currents, temperature, latitude, and longitude. These factors will help us determine the mortality constant for coral reefs. Anomalously high ocean temperatures are though to significantly contribute to this problem. Our approach captures the dynamics of coral disease both in space and time, and accounts for the highly seasonal nature of the annual outbreaks. We plan to apply a novel combination of spatiotemporal statistics to study the disease progression by creating a connectivity graph between the various coral sites. The results have implications for designing management policies appropriate for coral reef conservation. At this stage of the project we are focusing on assessing the stability of the different derivative methods and determining which one is best for our project. This research was funded by HBCU-UP Grant 1137472 and MARC Grant 5T34GM008422.

STT-P50

Developing An X-Ray Test Stand using a Narrow Gap Detector

***Ykeshia Zamore**, Undergraduate Student, College of Science and Mathematics*

We present the initial design of UVI's X-ray detector test facility. This facility is designed to be a working copy of the X-ray detector test facility operated by our colleagues at NASA-Goddard Space Flight Center. The facility at UVI will allow UVI researchers and students to carry out research projects in support of NASA's Science Mission Directorate strategic goals and will allow UVI students to gain hands-on engineering research experience. We also present preliminary component testing results from the initial installation of the facility here at UVI.

STT-P51

Study of Poverty Distribution in St. Thomas, VI

***Alphea Browne**, Undergraduate Student, School of Business*

In a 2014 article, The Washington Post stated, "It's clear in America that family structure and poverty are intertwined: Nearly a third of households headed by single women live below the poverty line." Additionally, a study by Je Moua reveals, "that with post-secondary degree, a person is not bound to live in poverty." The 2010 census revealed a 21% poverty rate in St. Thomas. There are factors which may have contributed to this poverty rate such as educational attainment, crime, unemployment, and high cost of living, to name a few. This study aims to understand the distribution of poverty in St. Thomas. Poverty distribution would be examined by census block groups and compared with educational attainment – adults 25 years and older with post secondary education – and family structure – single mother families. Geographic Information Systems (GIS) would be used to display the results.

STT-P52

Flooding Hazards on St. Thomas, USVI

***Lacima Pickering**, Undergraduate Student, School of Business*

The purpose for this project is to identify the various locations on St. Thomas that are at risk for flooding hazards. This project will assess the risks of floods and the vulnerability of specific areas that are in a flood zone. Flood hazards should be a major safety concern for everyone in the Virgin Islands.

STT-P53

Prevalence of Childhood Obesity in the East End Area on St. Thomas

***Sudi-Ann Lewis-Dawkins**, Undergraduate Student, School of Nursing*

Obesity, specifically in children and adolescents, may lead to serious health problems in the future. The aim of this study was to obtain the Body Mass Index of the students located on the East End area on St. Thomas, U.S.V.I and compare to Texas students. With this data, the percentage of East End students' BMIs that fall into the categories of underweight, healthy weight, overweight or obese were determined. The East End students BMI status was acquired using the School Physical Activity and Nutrition Project survey. The BMIs of the students were calculated manually using the BMI formula taken from the Center for Disease Control and Prevention and clarified with an EXCEL BMI calculator. As a result of completing this research it was determined that the East End area had a higher percentage of students that were overweight and obese than Texas. East End percentage normal weight: 4th graders: 60%, 8TH:66%, 11TH:60%. East End percentage overweight: 4th graders: 16%, 8TH:28%, 11TH:34%.East End percentage obese: 4th graders: 21%, 8TH: 13%, 11TH:21%. The results of this research may be used in the future to support efforts to improve school food choices and integrate an environment that is conducive to physical activity.

STT-P54

Exploring Themes in Recruitment for a Study with Women

***Kymberli Simon**, Undergraduate Student, College of Liberal Arts and Social Sciences*

Presently in the U.S. Virgin Islands, the lifetime prevalence of intimate partner violence (IPV) among women is significantly high at 32.8%. The purpose of this study was to explore themes associated with recruitment of an ongoing intimate partner violence intervention study. Recruitment for an intimate partner violence study may be challenging, and discussing some themes why women did not participate may provide insights as to why enrollment into an IPV study is below projected numbers.

STT-P55

Understanding Perceptions of Family-centered Care

***Karen Brown**, Associate Director, VIUCEDD*
***Yegin Habtes**, Faculty and Executive Director, VIUCEDD*
***Shamika Thomas**, Staff - Program Coordinator, VIUCEDD*

Family-centered care (FCC) is an approach to health care that recognizes that a partnership among patients, families, and health care professionals is essential to providing quality care and is a critical element in providing a medical home to children with special health care needs (Coker, Rodriguez, & Flores, 2010). One important component of family-centered care involves health care and service providers respecting family cultural norms and values (MacKean, Thurston, & Scott, 2005). However, the literature is scarce with regards to the perspectives of individuals with intellectual and/or developmental disabilities (I/DD) and their families concerning the quality of services rendered by a variety of service providers. The study in this proposal seeks to add to the scant literature on this topic and gain an understanding of respondents' lived experiences. Specifically, the researchers in this study sought to determine: 1) What do individuals with intellectual and developmental disabilities and their families want and need from professionals and 2) To what extent these wants and needs were being met.

STT-P56

Implications of an Aging Population on Economic Growth and Social Development in the USVI

***Andrea Wilson**, Graduate Student, College of Liberal Arts and Social Sciences*

As the population grows older, there will be broad economic consequences for the United States Virgin Islands. It is projected that the federal programs that provide assistance for the elderly will be in jeopardy. People over the age of 55 are making an increasingly large percent of the population. In addition to this increase in the elderly population, is the large number of foreign born elders. This in itself also has social implications. This paper uses evidence from the 2000-2010 Census and also data from the 2003-2013 USVI Community Survey to shed light on the issue. These documents will provide a comparative analysis of the aging population during the years 2000-2010 and 2003-2013. At the same time this study offers evidence that with an increasingly aging population there will likely be some combination of major structural changes to public support programs and to rethink its outlook on policies on working and retirement.

STT-P57

St. Thomas Roundtable Abstracts

Marine Disease Management

***Marilyn Brandt**, Faculty, Center for Marine and Environmental Studies*

Emerging marine diseases have been increasing in abundance and extent over the last several decades. The emergence of these diseases has been associated with habitat alteration and destruction as well as stressors resulting from climate change. While research is ongoing into the etiology of many of these emerging marine diseases, there is great debate over whether it is possible, ethical or cost-effective to directly manage disease when it occurs in wild populations. This roundtable discussion will debate the merits, ethics, and potential impacts of attempting to directly manage marine diseases in wild populations through mechanisms such as culling, quarantine, genetic manipulation and antibiotic application.

STT-R1

An investigation of performing practices of entering high school music students into the University of the Virgin Islands instrumental music program; through examination of curriculum design, performance requirements, teacher preparation, with panelist recommendations for further studies

***LeRoy Trotman**, Faculty, College of Liberal Arts and Social Sciences*
***William Johnson**, Faculty, College of Liberal Arts and Social Sciences*
***Erick Willie**, Junior High Band Director, Department of Education (St. Croix)*
***Deionne Donadelle**, High School Band Director, Department of Education (St. Thomas-St. John)*
***Niels Goodings**, Junior High Band Director, Department of Education (St. Thomas-St. John)*

The quality of instrumental music performance in the United States Virgin public school system and community has deteriorated as is evident by auditions of entering freshmen. Under the premise that University ensemble performance standards have a direct correlation to type and quality of instrumental music instruction in K-12 programs. Therefore, it is critical to create dialogue to address all levels. Quality is defined as a universal concept of tone production, high independence in music reading, interpretive and improvisational skills that distinguish "folk" or self-taught music musicians from trained performers. Questions to be addressed: 1. Can a designed strategic plan positively enhance instrumental music at schools, university, and community levels? 2. Should the University create additional instrumental music courses for practicing instrumental instructors in the area of individualized skill development and literature? 3. In what way may the University of the Virgin Islands approach a partnership with the Department of Education in development and implementation of a comprehensive system of training for instrumental teachers and students? 4. Does a written document exist within the university that articulates the need for full dialogue, design, and cooperation of parochial, private, and public institutions to address training of instrumental teachers and students?

STT-R2

Safe Sexting - A Community Concern Presentation

***Dahlia Stridiron**, St Thomas Campus, Counseling and Placement, Staff*

Learn about the impacts of sexting and how we all have a role to play in preventing sexual harassment & sexual violence facilitated by today's technology.

STT-R3

Sexual Selection and its Relation to Isolative Reproduction in Three-spine Stickleback (*Gasterosteus aculeatus*)

***Kyle Gonsalves**, Undergraduate Student, College of Science and Mathematics*

Sexual selection is a process by which a specific set of traits are favored and can consequently lead to divergent speciation. Recent studies have found that there is currently a divergence of species occurring amongst the three spine stickleback. This emergent speciation has caused scientists to categorize populations as separate species known as limnetic and benthic. This occurred due to reproductive isolation. Two primary sensory elements that may be involved with sexual selection are olfaction and the lateral line system. Our research interests lie in the significance of olfaction and the lateral line systems in female mating choice. We hypothesize that if olfaction and/or the lateral line systems are removed, female three-spine stickleback will be unable to distinguish between the two species. A study will be conducted to determine the effect that olfaction and the lateral line system have on female selection. We anticipate heterospecific mating will occurs due to the importance of the olfaction and the lateral lines in reproductive isolation. I expect that these senses are vital in the female's ability to distinguish between mates. By removing them the female will be unable to clearly differentiate between the two species. With these results we will understand the importance of these two sensory systems in stickleback mate choice both individually as well as their interactions.

STT-R4

Racial Profiling

***Dahlia Stridiron**, St Thomas Campus, Counseling and Placement, Staff*

The purpose of the forum is to have a conversation among students, faculty, staff and persons in the community to discuss if racial profiling is a problem in the Caribbean. The panelists will also discuss the impact that race, religion, ethnicity, and national origin have on racial profiling.

STT-R5

Effective Social Media Use in the VI: How/Why it Can Work Better

***Dara Cooper**, Cooperative Extension Services, Staff*

This round table examines social media platform habits, multi-media technology and the vital role these vehicles will play in converting the current use of advertising media in the Virgin Islands. The purpose of this project is to demonstrate how new media technology behaviors affect communication skills. The discussion will also include the methods in which social media and related technology are effecting change based on the current ways people learn and share information. To achieve this goal, multimedia elements such as video, infographics and text are used. I will be using research-based experiences throughout my role as a UVI Cooperative Extension Agent and WUVI Station Manager, as well as training in the New Media Journalism Masters program at Full Sail University. The goal is to create a powerful media network by providing evidence that a thoughtful collaborative effort of creating a viable communication network is needed at the University and throughout the Virgin Islands community.

STT-R6

St. Thomas Demonstration Abstracts

Coral and sponges in Caribbean reefs: interactions and threats

***Andia Chaves Fonnegra**, Faculty, Center for Marine and Environmental Studies*
***Marilyn Brandt, Faculty**, Center for Marine and Environmental Studies*

Corals and sponges are important organisms that compete for space on Caribbean reefs. However, as corals have declined in response to stressors, sponges have increased in abundance and cover. However, threats such as diseases affect both sponges and corals. In this demonstration, we will be presenting examples of interactions between sponge and corals, their diseases and perspectives on current research. This with allow our audience to understand what are sponges and corals, how they compete, what factors may contribute to the increase in diseases, and how the competitive interaction between corals and sponges can change and modify the structure of Caribbean coral reefs.

STT-D1

Touch-tank demonstration

***Howard Forbes**, Staff, Center for Marine and Environmental Studies*
***Jarvon Stout**, Undergraduate Student, Center for Marine and Environmental Studies*

The Virgin Islands Marine Advisory Service will be facilitating demonstration touch tank at UVI's Research Day 2016. This touch tank will feature various marine invertebrates such as brittle stars, sea urchins, sea cucumbers, and cleaner shrimp. Many of these invertebrates are found in nearshore shallow environments and tend to prefer shaded areas such as those under rocks. On-lookers will have the opportunity to learn about biodiversity and the important roles that each of these organisms play to maintaining ecosystem balance. These organisms are all safe to handle as caution is exercised and that they are kept in oxygenated water.

STT-D2

Let's get muddy! How and why we sample mud in coastal habitats

***Kristin Wilson Grimes**, Faculty, Center for Marine and Environmental Studies*

Blue carbon ecosystems (mangroves, seagrass meadows, and salt marshes) take significant amounts of carbon out of the atmosphere and store most of this carbon belowground in their roots and in the sediment. This demonstration will show the methods we use to collect and measure sediment carbon from geologic cores, and will feature sediment samples from some of these habitats for participants to touch and explore. The demonstration will also feature a game that will ask participants to rank habitats by the total carbon stored in each. This will help participants discover how blue carbon habitats stack up against others, like temperate forests and rainforests.

STT-D3

Use of bioacoustics for wildlife survey in the US Virgin Islands

***Renata Platenberg**, Faculty, College of Science and Mathematics*

Bioacoustics is the use of digital technology to record and analyze the sounds of wildlife. Bioacoustic methods have the potential to reveal detailed information about species that act as important ecosystem health indicators in the US Virgin Islands, specifically bats and frogs. The SM3BAT acoustic recorders demonstrated here allow the simultaneous capture of both acoustic and ultrasonic signals, allowing data to be collected for both frogs and bats. The recorded signals are analyzed using acoustic software that provides a visual sonograph representation of the call signals. Information gained from the recordings includes species identification, time of activity, type of activity (e.g., bat echolocation is discernable from feeding) and species overlap. The demonstration will allow participants to examine the recorders and microphones and to identify species using the acoustic analysis software. A handheld "Echometer" bat detector that works on an iOS platform will also be available for demonstration.

STT-D4

Innovation with 3D Printing

***Timothy Faley**, Faculty, School of Business*

Three-dimensional (3D) design and printing.
STT-D5