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AGR-01 An evaluation of three pigeon pea (*Cajanus cajan*) cultivars in North Florida: Timing of planting, crop growth, grain development and composition. C.S. GARDNER, G.L. QUEELEY, B.G. BROWN and K.T. GRANT. Cooperative Extension Program, College of Engineering Sciences, Technology, and Agriculture, Florida A&M University, Tallahassee, FL 32307. Pigeon peas constitute about 5% of world legume production (3.5 million hectares). Although the plant is highly drought tolerant and adaptable to different climates, it is susceptible to frost. This characteristic makes the choice of cultivar and timing of planting extremely important, especially in north Florida where the growing window runs from April to November. The objective of this experiment was to evaluate the effect of three planting dates on growth and yield parameters of 3 pigeon pea cultivars and to assess the potential of the crop as an alternative food source. The experimental design was a randomized complete block, using three planting dates (May 16, June 5, and June 26) and three cultivars (76 W, 99 W and DO). Data were collected on flowering percentage at 60 days after planting (DAP), plant height, pod yield, grain yield and nutrient composition of the grain. The results indicated a significantly higher proportion of plants with flowers at 60 DAP for the May 16, planting date. However, the most significant growth, pod, and grain yield, were observed for the June 5, planting date. Timing of planting did not have any effect on the nutritional composition of the grain. Nutrient analysis of the grain revealed crude and digestible protein percentages ranging from 20 to 25 and 18 to 21 respectively, while fat composition ranged from 1.4 % to 3 %. These results indicate strong evidence that the pigeon pea is a highly nutritional food source and can be successfully grown in north Florida.

AGR-02 Effects of quality of neighborhood parks on adjacent property values. A.B. LORENZO, L. YU, and G. CUMMINGS. Landscape Design and Management Program, College of Engineering Sciences, Technology, and Agriculture, Florida A&M University, Tallahassee, FL 32307. As one of the most densely populated counties in Florida, Tallahassee's Leon County is just one of many areas that lost much of their natural habitat due to the rapid rate of residential and commercial development. In response to this trend, the local government has been increasing its efforts to locate and to protect the most important open space areas, including greenways, wetlands, wildlife habitat, farmlands, forests, and outdoor parks and recreation areas. Using hedonic pricing technique, this study measures the effect of proximity to parks and park quality on house values in Tallahassee, FL. When all other structural and neighborhood attributes were equal, the expectation was that homes in close proximity to quality parks will be more expensive than homes at a distance. In order to account for the quality of the park, cleanliness, landscaping, available spaces, amenities, and safety were incorporated, which

assumes that the higher parks rate on these criteria, the greater the value of neighboring homes. The results highlight the potential impacts and provide insight to local governments when considering development of neighborhood parks. The coefficient on distance to parks was negative and statistically insignificant, meaning that close proximity to parks did not significantly increase home values. Among the park quality variables, cleanliness, landscaping, and amenities had negative coefficients but not statistically significant, suggesting that houses close to parks rated clean, with better landscaping, and providing amenities and safety had higher prices than houses farther away.

AGR-03 Identification of HoCV-1 virus in Texas glassy-winged sharpshooters. P. MARSHALL (1), W.B. HUNTER (2), D. HAIL (1), and B. BEXTINE (1). (1) Univ. Texas-Tyler, 3900 Univ. Blvd., Tyler, TX, USA, (2) USDA, ARS, U.S. Hort. Res. Lab, 2001 S. Rock Rd., Ft. Pierce, FL 34945, USA. Adult leafhoppers collected in Texas were shown to be infected with a new strain of the leafhopper virus, *Homalodisca vitripennis* virus, HoVV-1. The new virus strain was isolated from Glassy-winged sharpshooters, GWSS, *H. vitripennis*, (Hemiptera: Cicadellidae) collected from grapevine. Genetic characterization demonstrated the presence of 10 SNP's within the capsid sequence which produced amino acid changes. Further experiments are examining if this new strain (HoVV-1, TX strain) is more or less pathogenic than the original virus isolated from leafhoppers in California and Florida. The original virus genome was sequenced, and the path of infection into the leafhopper was determined to be through the midgut tissues. Presently only a few viral biological control agents are available for use in the management of leafhopper pests. Leafhoppers like the GWSS are the main vectors of plant diseases such as Pierce's disease of grapes, a plant-infecting bacterium, *Xylella fastidiosa*. The leafhopper-infecting virus was now been shown to be infecting field populations of GWSS across several different states from Florida, Texas, and California. Examination of tissues by electron microscopy supports the midgut tissues as the entry site and it also appears to be the primary tissue supporting virus replication. Naturally occurring leafhopper viruses may have further uses towards reducing the spread of Pierce's disease.

AGR-04 Management of cogongrass with Florida native grass species and herbicide. O.U. ONOKPISE, S.K. BAMBO, and J.J. MUCHOVEJ. College of Engineering Sciences, Technology and Agriculture, Florida A&M University, Tallahassee, Florida 32307. Cogongrass (*Imperata cylindrica* L.) is an undesirable species in the Gulf Coast States due to its invasiveness. Field experiments were conducted from 2007 to 2008 in north Florida to utilize revegetation strategies after treating cogongrass with herbicides. Native grass species, muhlygrass (*Muhlenbergia capillaries* [Lam] Trin.) and switchgrass (*Panicum virgatum* L.) were raised in the greenhouse for eight weeks and field plots were planted with these natives after two weeks of herbicide (glyphosate and imazapyr) applications to natural infested areas. The experiment was a randomized complete block design with three treatments and three replicates. Treatments were applied to suppress cogongrass and these included imazapyr, glyphosate, and control (mowed). Plots were evaluated every four months after field planting for native grass survival and percentage cogongrass re-infestation. Native species survival varied significantly among treatments, with glyphosate recording the highest survival rate and control being the lowest. Similar survival rate (10 to 40%) was obtained with native species in control plots. Survival rate for switch and muhlygrass were 28 to 67% and 42 to 68%, respective in imazapyr plots, while for glyphosate, survival were 70 to 82% and 84 to 93% for switchgrass and muhlygrass, respectively. Re-infestation was 100% in the control plots, while infestation ranged from 0 to 20% and 0 to 3% for glyphosate and imazapyr, respectively. This study reveals that revegetation immediately following glyphosate is best due to its lack of soil activity. On the other hand, imazapyr is the best to suppressed cogongrass, but may need a longer than two weeks to achieve proper survival of the native species.

AGR-05 Growing scotch bonnet hot pepper in shade houses: Manipulating light intensity to boost productivity. G.L. QUEELEY, C.S. GARDNER, T.A. HYLTON, K.T. GRANT, B.G. BROWN, E.E. CLARKE and K.M. LEWIS. Department of Agricultural Sciences, Florida A&M University, Tallahassee, FL., 32307-4100. This experiment was conducted to determine the optimum level of light (shade) required for Scotch Bonnet hot pepper production. The experimental design was a randomized complete block with four treatments (levels of shade): Zero shade (a control using natural daylight) 27 % shade, (83 % luminance) 52 % shade (48 % luminance) and 90 % shade (10 % luminance). Data were collected on growth and yield parameters of the crop. By the completion of data collection, none of the plants in the 90 % shade treatment showed any signs of flowering. This treatment also resulted in a significant number of undesirable characteristics, such as tall spindly plants, large thin leaves as well as a reduced number of leaves and branches. After two years of experimentation, we concluded that this treatment was unacceptable for the production of the crop. We found no significant difference in the times to flowering between the control, the 27 % and the 52 % shade treatments. However, both the control and the 27 % shade treatments produced significantly larger fruits ($p < 0.05$) compared to the 52 % shade

treatment. Fruits plant-1 were the same for the control and 27 % shade treatments. Highest marketable yield (627 kg ha^{-1}) was obtained from the 27 % shade treatment.

AGR-06 Influence of designed landscapes on crime. A. THOMPSON, A.B. LORENZO, and G. CUMMINGS. Landscape Design and Management Program, College of Engineering Sciences, Technology, and Agriculture, Florida A&M University, Tallahassee, FL 32307. Nationally, crime rates have dropped since 1990, but the number of crimes remains high. This might be attributed to the thousands of dollars spent each year for research on crime prevention and criminal motivation. The decline can also be the result of increased and improved neighborhood crime watch programs and vigilantism. In addition, landscaping and green/open areas within urban environments have been shown to alleviate some of the problems linked with crime, including promoting social communication and stronger ties among neighbors, greater sense of safety and adjustment, and recovery from urban-associated mental fatigue. While vegetation has been cleared from crime-ridden areas because of the potential for these areas to become refuges for criminals, research has suggested that the opposite may be true: vegetation may lead to safer environments. The relationship between the amount of vegetation and the level of property crime within the City of Tallahassee was evaluated. Results indicated a statistically significant negative relationship between the incidence of property crime committed in the city and the amount of vegetation as measured using Normalized Difference Vegetation Index (NDVI) within the area in which those crimes occurred. Areas with less than the average mean NDVI level had an increased frequency of crime. Results indicated statistically significant relationships between the amount of vegetation and traditional social-economic variables (*i.e.*, income level, unemployment, housing density), and level of property crimes committed. Results also indicated that the amount of vegetation could predict the likelihood of a household becoming a victim of property crime.

AGR-07 Healing gardens: A participatory study on the therapeutic benefits and users' satisfaction. L. YU, and A.B. LORENZO. Landscape Design and Management Program, College of Engineering Sciences, Technology, and Agriculture, Florida A&M University, Tallahassee, FL 32307. This study evaluates three gardens at hospitals and healthcare institutions in Tallahassee, Florida. The gardens were designed and built primarily as healing environments for patients, families, and staff. All three gardens have seating areas; flowers and plants in various types, forms, and spatial arrangements. The gardens also differed in accessibility to user groups. The objectives of this research were: (1) to provide a research-based baseline of garden use, (2) to investigate the process of emotional healing that occurs as patients, families, and employees used a healing garden, and (3) to measure patients, families and staff satisfaction with the built environment of the existing healthcare facilities. A questionnaire survey was conducted to determine whether the garden was meeting the goals of reducing stress, changing moods, restoring hope and energy, and increasing consumer satisfaction. Results from the questionnaire survey indicated differences in responses among age groups, user category, and usage patterns across gardens. Results also indicated a number of benefits of the gardens. As anticipated, users experienced positive mood change after spending time in the garden which appears to influence increased consumer satisfaction. Recommended changes for the garden gained from different users include inclusion of more flowers, more seats and tables, additional water features, and restricting smoking. The implications of the findings for the design, planning, and improvement of gardens; and the subsequent evaluation of healthcare facilities are discussed.

AGR Posters

AGR-P01 Production of table cucumber (*Cucumis sativa*) on two trellis systems in North Florida. B.G. BROWN, C.S. GARDNER, G.L. QUEELEY, K.T. GRANT, and T.A. HYLTON. Cooperative Extension Program, Florida Agricultural and Mechanical University, Tallahassee, FL 32307. The use of trellises to support vine crops such as tomato, squash and cucumber may result in increased fruit quality compared to the conventional practice of allowing the vines to run freely on the ground. Other stated advantages of the trellis system include better canopy light interception, better control of pest and ease of harvesting. However, there is still much debate over whether the use of trellises results in increased yield. The objective of this study was to determine the performance of trellis grown cucumber *vs*. conventional practice. A two year study was done at the FAMU research and extension center, Quincy Florida. The experimental design was a randomized complete block with three treatments: A-frame trellis, wire trellis and conventional practice as a control. Parameters measured included fruit size (length and circumference), fruit quality and total yield. Treatment effects were evaluated by Analysis of Variance and Fisherâ€™s exact test. Despite numerically higher numbers of spoiled fruits from the conventional practice, the results showed no significant treatment effect. The study concluded that the use of trellises provided no advantage over the conventional system with respect to the parameters measured.

AGR-P02 Comparative genomics of leafhoppers: Three vectors of *Xylella fastidiosa*. W.B. HUNTER (1), K.S. SHELBY (2), L.E. HUNNICUTT (3), R.F. MIZELL (4), C. TIPPING (5), and P.M. DANG (6). (1) USDA, ARS, U.S. Hort. Res. Lab, Ft. Pierce, FL, 34945, USA, (2) USDA, ARS, 1503 S. Providence, Res. Park, Colombia, MO, 65203, (3) North Carolina State Univ., Genomics Sci., 128 Polk Hall, Raleigh, NC 27695, (4) Univ. Florida, IFAS, N. Florida, REC, 155 Res. Rd., Quincy, FL 32351, (5) Delaware Valley College, 700 East Butler Ave., Doylestown, PA 18901, (6) USDA, ARS, NPRU, 1011 Forrester Dr, SE., Dawson, GA 39842. Leafhoppers are considered the second most important vector of agricultural diseases after aphids. We examined transcription expression across three sharpshooter leafhoppers; *Homalodisca vitripennis*, GWSS, *Graphocephala atropunctata*, BGSS, and *Oncometopia nigricans*, BWSS, which are vectors of the plant-infecting bacterium, *Xylella fastidiosa*, which causes Pierce's disease of grapes. Use of genomic data provides information on the biology and relatedness of these and other leafhoppers. A genomics approach also advances the understanding of leafhopper immunity, pathology, and development. As new developments in genomics and RNAi methodologies emerge, researchers are now able to use this genetic information to design highly specific and effective management tools to reduce leafhoppers, and leafhopper-transmitted diseases. The importance of these leafhoppers as vectors of Pierce's disease; plus the abundance of ESTs produced for each and their differences in host plant preferences, provide an excellent opportunity to conduct comparative examination in leafhoppers. Several cDNA libraries which had been made from adult GWSS, BGSS, and BWSS, plus nymphs, and other tissues, provides a resource totaling almost 50,000 ESTs. When assembled we obtained ~5,000 specific transcripts for each species for comparison. This is approximately one-third of the all predicted active genes available, as other insect genomes have demonstrated ~15,000-17,000 total genes. These data were used for analyses between these species, and other genomes. Further analyses were conducted in silico using software programs available online, Internet Resources, NCBI, EXPASY, and others to compare assembled data, predict proteins and compare them to the broader scope of insect genomes. Many other genes of interest which have various functions in leafhopper biology and physiology have also been identified but are not reported herein. The EST sequences reported in this study have been deposited in GenBank's dbEST (Hunter, NCBI).

AGR-P03 New Taastrup-like virus: Leafhopper infecting rhabdovirus. W.B. HUNTER, M. MARUTANI-HERT, and S. ADKINS. USDA, ARS, U.S. Hort. Res. Lab, 2001 S. Rock Rd, Ft. Pierce, FL, USA 34945. A new viral pathogen of leafhoppers was discovered. The unclassified virus, is a negative sense, single-stranded RNA virus, which appears to be a new member of the order Mononegavirales, in the family Rhabdoviridae, and thus far is the only member identified world-wide which is related to a recently described Taastrup virus, which is also an unclassified member in the Rhabdoviridae. The virus was isolated from an ornamental plant, and when applied to leafhopper cell cultures caused rapid and severe cell death. Current efforts are attempting to propagate and sequence the virus to solidify its taxonomic classification. New discoveries of insect infecting viruses continues to expand virus taxonomy, as well as advances the potential biological control agents which may be applied in the management of severe agricultural crop pests, like leafhoppers.

AGR-P04 Proposed metagenomics approach to Asian Citrus Psyllid-Huanglongbing: Applications in vector biology. W.B. HUNTER, M. MARUTANI-HERT, C.L. MCKENZIE, R.G. SHATTERS, and D.G. HALL. USDA, ARS, U.S. Hort. Res. Lab, 2001 S. Rock Rd., Ft. Pierce, FL 34945. The Asian Citrus Psyllid (AsCP) is a highly competent vector of the phloem-inhabiting bacterium *Candidatus* Liberibacter asiaticus, the bacterial agent associated with the disease Huanglongbing, HLB. However, little information is available regarding immunity genes in Psyllids so far. To understand genome wide sequence of this pest, a cDNA library was constructed using wild adult *Diaphorina citri* from citrus trees in Picos Farm in Fort Pierce, FL in 2005. In this cDNA library, we found gene homologues related to stress adaption, including the heat shock proteins: hsp70, hsc70, hsp90; insecticidal resistance: Cytochrome P450; and immunity: Glutathione-S Transferase, Super Oxide-Dismutases. In this study, we examined mRNA level of these genes in response to heat shock, wounding and insecticide (imidacloprid) treatments using quantitative RT-PCR. In order to induce heat shock responses, psyllids were incubated at 55°C. Sterile injury was performed by ventrolaterally wounding of the adult abdomen using a dissecting needle. Results shows only tubulin and heat shock protein 70 were induced by heat shock (55 °C) and wounding treatments at 1h, but decreased by 6h. Adult *D. citri* were exposed to imidacloprid via plant sap. Neither of the gene expression level was changed by this treatment. Heat shock genes are known to respond to a variety of stresses, such as exposure to xenobiotics, heavy metals, metabolic poisons and temperature extremes. While the *D. citri* hsp70 was not induced by imidacloprid, it was involved in heat stress and wounding. These approaches provide insights into how the psyllid responds biologically to stresses so that new management methods can be developed against AsCP and the spread of HLB in citrus.

AGR-P05 Preliminary evaluation of small scale prawn production in ponds. U.A. MADDEN (1), G. NURSE (1), J. BEAUDOUIN (1), A. BOLQUES (1), L. MURALLES (1), S. HARRIS-THOMPSON (1), G. QUEELEY (1), A. WALLAMSLEY (2), M. MAY (3), and F. CHAPMAN (4). (1) Extension and Outreach Program, College of Engineering Sciences, Florida A & M University, Tallahassee, Florida 32307, (2) Florida Farm Bureau Federation, Gainesville, Florida 32614, (3) Florida Department of Agriculture and Consumer Services, Tallahassee, Florida 32310, and (4) University of Florida, Gainesville, Florida 32611. Three ponds were used in this study of fresh water prawns (*Macrobrachium rosenbergi*) to provide hands-on training and demonstrations, and extension assistance to small, limited resource economically disadvantaged farmers to optimize production systems (ponds). The study began on June 27, 2008 and ended November 24, 2008. Duplicate water samples were taken for analysis of pH, temperature, and dissolved oxygen and water depth and ambient temperature data as ponds were monitored. On Day-0, thirty day-old juvenile prawns were placed in Ponds 1 and 2 (3000 each) and 3 (2,000 prawns). Prawns were fed a 36% protein diet once daily after Day-30 at 11.36 kg per acre with prawn density of 12-18,000 per acre. At Day-139, prawns were harvested, counted, weighed and 20 prawns from each pond were measured and weighed. Pond 2 had significantly higher ($p < 0.001$) mean dissolved oxygen concentration and significantly higher ($p < 0.0001$) mean pH than Ponds 1 and 3. Mean dissolved oxygen concentration for Day-52 was significantly higher ($p < 0.001$) than all others except for Day-44. Mean water temperature for Pond 1 was significantly higher ($p < 0.0001$).than those for Ponds 2 and 3. Significant differences ($p < 0.0001$) were observed for mean water temperature for various days of the study. Prawns in Pond 3 had significantly ($p < 0.0001$) greater length than those in Ponds 1 and 2. Greater production was in Pond 3 (38 animals) than Ponds 1 and 2 with 50 animals weighing 1 pound.

AGR-P06 Establishment of *Diaphorina citri* cell lines. M.M. MARUTANI-HERT, WB. HUNTER, and D.G. HALL. USDA, ARS, U.S. Hort. Res. Lab, 2001 S. Rock Rd., Ft. Pierce, FL 34945. The Asian citrus psyllid (AsCP), *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae), is a highly competent vector of the phloem-inhabiting bacterium *Candidatus* Liberibacter asiaticus that is associated with the citrus disease huanglongbing (HLB). Commonly referred to as citrus greening disease in the USA, HLB causes reduced fruit yields and quality leading to tree death and is considered the most serious citrus disease. HLB has become a major limiting factor to the production of citrus world-wide. Studies of HLB have been impeded by the fact that *C.* Liberibacter has not yet been cultured on artificial nutrient media. After being acquired by a psyllid, *C.* Liberibacter asiaticus was reported to replicate within the psyllid and was retained by the psyllid throughout its life span. Therefore, we hypothesized that *C.* Liberibacter asiaticus could be cultured in-vitro using psyllid cell cultures as the medium and investigated the establishment of a pure culture for AsCP cells. Several commercially available insect cell culture media and media we developed were screened for viability to culture cells from AsCP embryos. Cells from psyllid tissues adhered to the plate and migration was observed within 24 hrs. Cells were maintained at 20°C. We successfully established primary psyllid cell cultures, referred to as DcHH-1, for *Diaphorina citri* Hert-Hunter-1, with a new media, Hert-Hunter-70.

AGR-P07 Identification of a novel reovirus in *Diaphorina citri*. M.M. MARUTANI-HERT, W.B. HUNTER, and D.G. HALL. USDA, ARS, U.S. Hort. Res. Lab, 2001 S. Rock Rd., Ft. Pierce, FL 34945. The Asian citrus psyllid, *Diaphorina citri*, transmits one of the plant pathogenic bacterium, *Candidatus* Liberibacter asiaticus , and this bacterium is strongly associated with the occurrence of Huanglongbing which is one of the most devastating diseases of citrus. To identify new biological control agents in psyllid populations, we examined a psyllid cDNA library prepared from field collected adult psyllids (Hunter et al., 2005, 2006). We identified two viral sequences one 616 base pairs and a second, 792 base pairs, both had significant similarity to viruses within the insect reovirus group. Phylogenetic and homology comparisons indicated that the viral sequences were most closely related to the viruses in the Family Reoviridae, Genus *Fijivirus*, specifically *Nilaparvata lugens* reovirus (NLRV). From the genetic evidence, we propose that this new reovirus be classified as *Diaphorina citri* reovirus, Florida strain-1. We examined infection rates within psyllid populations and viral pathogenicity on an insect cell culture as a rapid screening tool. To better understand the potential of using this pathogen to reduce psyllid populations, we identified that 20% of psyllids in the green house colony were infected with this virus and up to 55% in field populations. Rates of infection were similar for adult males and females. When inoculated into an SF9 insect cell line the psyllid reovirus was shown to negatively affect cell viability. These data suggest that this new psyllid-infecting reovirus may provide tools to develop a novel strategy for the management of psyllid populations.

AGR-P08 Endosymbionts associated with the Asian Citrus Psyllid (*Diaphorina citri*). M.M. MARUTANI-HERT, W.B. HUNTER, and D.G. HALL. USDA, ARS, U.S. Hort. Res. Lab, 2001 S. Rock Rd., Ft. Pierce, FL 34945. Citrus greening known as Huanglongbing is one of the most severe diseases of citrus in Asia and Africa. It is caused by an uncultivable, gram-negative, phloem-limited bacterium, *Candidatus* Liberibacter spp., belonging to the Î±-subdivision of

Proteobacteria. The disease is transmitted from infected to healthy plants by the Asian citrus psyllid, *Diaphorina citri* (Hemiptera). Insects such as psyllids feed on the phloem of plants, and their diet is rich in carbohydrates but is deficient in essential amino acids. These insects have maternally inherited bacterial mutualists. They are referred to as endosymbionts. The endosymbionts help supplement their host's diet. In order to investigate the endosymbiotic microbiota of psyllids, we analyzed eubacterial 16S rDNA amplified from *D. citri*. Eight types of nucleotide sequences were determined and subjected to molecular phylogenetic analysis. *Wolbachia* which is the Î±- proteobacteria, four sequences of the Î²-proteobacteria including syncytium endosymbiont of D. citri, and three members of the Î³-proteobacteria. These data suggests that psyllids are supported by several endosymbiotic bacteria and contain a rich bacterial fauna which may have important interactions between each other and *C.* Liberibacter asiaticus when it occurs in psyllids.

AGR-P09 The effect of synchronization treatments on seasonal and non-seasonal goat does. A. MCKENZIE-JAKES, G. NURSE and G. BRYANT. Florida A&M University, Cooperative Extension Program, Tallahassee, FL. 32307. In the U.S., the seasonal breeding behavior of goats has prevented many producers from increasing productivity in their herd and accessing markets that bring the highest economic returns. In recent years, estrus synchronization has become a valuable reproductive tool among scientists for controlling and manipulating the breeding period in goats. Studies have shown that differences exist in onset and duration of the breeding season between various breeds of goats and even among individuals within the same breed. The objective of this study was to compare synchronization response in seasonal and non-seasonal does. Forty does were randomly assigned (10 per group) among four treatment groups. Goats in group A were exposed to a vasectomized buck, goats in group B were the control group, does in group C were synchronized using CIDR in combination with Lutalyse and goats in group D were synchronized using CIDR in combination with PG600. The same procedures were followed during the out-of-season breeding trials. The findings of this study showed that 85% of does in group C exhibited cyclic heat 24 hours or less after the implants were removed and 80% of the does exhibited heat less than 24 hours during the non-seasonal breeding trial. Only 40% of the does exhibited heat in treatment group B during the seasonal breeding period and 10% of the does responded when this treatment was administered during the spring trial. Furthermore, conception rates and pregnancy rates were significantly higher among does in treatment groups C and D regardless of the season.

AGR-P10 Integration of picorna-like viruses in multiple insect taxa. D.M. TUFTS (1), K. SPENCER (1), W.B. HUNTER (2), and B. BEXTINE (1). (1) Univ. of Texas at Tyler, 3900 Univ. Blvd., Tyler, TX, USA, (2) USDA, ARS, U.S. Hort. Res. Lab, 2001 S. Rock Rd., Ft. Pierce, FL 34945, USA. The Picornaviridae superfamily consists of over 450 species of positive single stranded RNA viruses. This family is unique in that all members have a protein that is attached to the 5' end which is used as a primer for RNA polymerase during transcription. Picorna viruses infect many different organisms, including mammals, birds, and insects. In this study we provide evidence that picorna-like viruses are present in a range of insect hosts and that this type of virus has integrated into the DNA of various insect species. We provide evidence of picorna-like viruses in the glassy-winged sharpshooter (*Homalodisca vitripennis*), HoVV; in the red imported fire ant (*Solenopsis invicta*), SINV; and in the European honeybee (*Apis mellifera*). Analysis of reverse transcriptase PCR (RT-PCR) demonstrated that viruses in the subgroup Dicistroviridae have integrated into the genomes of *S. invicta* and *A. mellifera*. However, integration of the leafhopper infecting virus, HoVV-1 into the glassy-winged sharpshooter, *H. vitripennis* was not detected.

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ANT-01 Detection of buried bodies using ground penetrating radar and conductivity. M.M. MARTIN, J.J. SCHULTZ and D.K. WARDLAW. Department of Anthropology, University of Central Florida, 4000 Central Florida Boulevard, Orlando, FL 32816. A controlled research site was constructed to test the applicability of two geophysical tools to detect buried bodies. Geophysical tools are nondestructive search methods that are commonly used in forensics and archaeology to highlight areas for further investigation. The two geophysical tools used for this project were a conductivity meter and a ground penetrating radar unit with a 500-MHz antenna. In this study, eight control graves were buried in a grid (11m × 22m) at a controlled facility with six graves containing a pig carcass as a proxy for a human body in each grave. Each of the pig graves represented a different burial scenario. The data was processed in two formats: as individual radargrams that were collected directly over the buried pigs and as time-slice maps created from interpolated radargrams collected over the grid. The conductivity data collected in the field was analyzed using Surfer® version 8.0 mapping software by creating contour maps. The GPR imagery will be compared to the conductivity imagery for the first month of data collection.

ANT-02 Detection of buried weapons using ground penetrating radar. D.K. WARDLAW, C.A. DIONNE and J.J. SCHULTZ. Department of Anthropology, University of Central Florida, 4000 Central Florida Boulevard, Orlando, FL 32816. Ground penetrating radar (GPR) is a non-intrusive geophysical instrument that has been utilized in archaeological settings as well as in forensic searches for clandestine graves. GPR uses electromagnetic (EM) waves to detect buried surfaces, features, and objects. Surveys can be conducted in a fast, non-destructive manner over large areas that can be replicated when necessary. What has not been attempted is to test the applicability of detecting buried weapons using GPR. In this study, 32 weapons, ranging in size and composition were buried in a grid (15m × 19m) at a controlled facility. The sample was comprised of 16 street-level decommissioned firearms (including pistols, revolvers, shotguns, and a rifle), 10 blunt or sharp edged weapons, and 6 scrap metals. Using a 500 MHz antenna the weapons were tested at multiple depths. The data was processed in two formats: as individual radargrams that were collected directly over the buried weapons and as time-slice maps created from interpolated radargrams collected over the grid. Results of this study show that GPR has significant potential for locating buried weapons in forensic settings.

ANT-03 In the race for the cure who is being left behind. A. ZAKARI. Dept. of Anthropology, University of Central Florida, Orlando, Fl 32816-0955. Breast cancer accounts for approx. 40,000 deaths per year in the United States, higher than fifty years ago and predicted to continue to rise globally. Hugely successful marketing machines of breast cancer awareness groups and pharmaceutical companies churn out a message of early detection and awareness through screening mammograms, which has lead to a 2% plus decline, mainly in Caucasians, in overall mortality. However, statistics show that the message did not translate to similar successes in long-term outcome for minorities, specifically Muslims. Although Muslims are a heterogeneous group in the U.S., certain key differences may distinguish them. In particular, attitudes toward medical intervention (*vs.* trust in God), and gender roles may differ from other U.S. groups. The United States has created a neoliberal model in its approach to disease and has accepted a consumptive approach for diagnosis and early detection through screening mammograms and other "medicalized" testing. Breast cancer awareness groups have been instrumental in shaping this movement, yet even in such a diverse country, they are still strikingly ethnocentric in their marketing and awareness campaigns. They have succeeded in lowering detection rates in some populations but as yet are not successful in advancing culturally sensitive screening and treatment alternatives in order to lower mortality rates among Muslims and other minorities. As corporations look to increase profits and compete globally the prevailing doctrines of early detection and consumer-oriented philanthropy will be applied overseas. As in the United States, these doctrines may not translate to statistical changes in outcome among all women.

ANT Posters

ANT-P11 Where Floridians bury their dead: An analysis of cemetery placement. A.L. GIROUX. Department of Anthropology, University of Central Florida 4000 Central Florida Blvd, Phillips Hall, Room 309, Orlando, Florida 32816-1361. Different ethnic and religious groups have varying customs involving the disposal of their dead. The Florida Bureau of Archaeology documented the ethnic composition of Florida's historic cemeteries and made this data available through the Florida Geographic Data Library (fgdl.org). This project analyzed the physical factors involved in the placement of burial grounds, established before 1900, in the tri-county area of St. Johns, Duval, and Clay Counties, Florida. The physical characteristics of prominence and distance from navigable water were examined using Geographical Information Systems (GIS). Of the 86 pre-1900 cemeteries in this tri-county area, 49 (57%) are located near navigable water and 19 (22.1%) are in an area of prominence. The remaining 18 (22.9%) do not fall into either category. Two trends are visible in regards to ethnic groups and their use of cemeteries in the tri-county area. Chi-square analysis show Anglos used more cemeteries in areas of prominence and Native Americans used more cemeteries near navigable water.

ANT-P12 Hispanic Obesity Prevention Education (HOPE): *Programa de Educacion Sobre la Obesidad* (PESO). L.S. LIEBERMAN (1), F. RIVERA (1), G. RIVADENEYRA (2), A. SALLAS (2), T. GRINDLE (1), D. SCHOOLER (1), and A. CLAYTON (1). (1) Department of Anthropology, University of Central Florida, Orlando, FL 32816, (2) Seminole County Health Department, 400 West Airport Boulevard, Sanford, FL 32773. Overweight and obesity prevalence are increasing worldwide and are major risk factors for chronic diseases. Participants were approximately 40 adults and 10 children who were members of an evangelical church and of Puerto Rican, Dominican and Cuban ethnicity. Educational sessions of food preparation and eating activities were conducted in the kitchen and basement area of the church over the course of five months. One session involved shopping at a local supermarket. Participants received items to increase knowledge about

food preparation and portion control with a focus on fruit and vegetable consumption. Weight, height, waist and arm circumferences, triceps skinfold and % body fat were measured at the beginning and end of the seven-session nutrition education intervention. The adult participants ranged in age from 17-80 (avg. 46.7) years for 26 females and from 24-76 (avg. 56.4) years for 9 males. Ninety-six % of the females had BMI's < 25 and 37.5% BMI > 30 and 88.9% of the males had BMI's < 25 and 77.8% BMI's > 30. Body fat percentage was measured with the Omron Fat Loss Monitor. Seven of the eight females, and the three males, were classified as having "High" or "Very High" body fat. One female and one male exceeded the measurement range (60 mm) of the Lange Skinfold calipers used for the measurement of the triceps skinfold (TS). Eleven (45%) females and four (44%) males had TS measurements > 95th percentile. Thirteen of 24 females had waist circumferences that > 35 inches and four of nine males had waist circumferences that > 40 inches. Five males gained an average of 6.5 lbs and 11 females lost an average of 3.4 lbs during the intervention. (Research was funded by a HOPE grant from the FL Department of Health.)

ANT-P13 Tools of a local economy: standardization and function among small chert tools from Caracol, Belize. L.R. MARTINDALE-JOHNSON. Dept. of Anthropology, Howard Phillips Hall Suite 309, UCF, 4000 Central Florida Blvd., Orlando, FL. 32816-1361. A detailed analysis of a sample of 229 small chert tools from a single locus used to produce crafts at the Maya site of Caracol, Belize elucidates household function during the Late to Terminal Classic Period (AD 550-900). Emphasis is placed on determining the function of these tools and on the nature of their use in the broader Caracol economic system. Analysis sought to determine whether they were used for day-to-day household tasks or for specialized craft activity within the specified household locus and/or if they were prepared for broader distribution at Caracol. A detailed analysis on artifacts from a single locus reveals insight into the impact of household production on the overall Caracol economy. The research draws on traditional techniques of lithic analysis, while assessing tool morphology and core reduction techniques; however, it is different from previous analyses in the Maya area in that it develops and applies specific quantifiable statistical methods (*e.g*., Coefficient of Variable) for a particular tool type(s) used in craft production. An application of quantifiable methods and a detailed analysis differentiate and determine chert tool variation or standardization, thus establishing ideal tool types within a craft production locus. The determination of the presence of standardization and ideal tool types demonstrates that craft production was indeed taking place immediately outside the epicenter at Caracol. Thus, while elites presumably controlled the distribution of crafts via markets located at and along causeway and termini, the spatial location of this workshop suggests that they may also have controlled the production of crafts near the site epicenter. Future research aims to reanalyze tools from previously excavated craft production areas and to test for the presence of additional crafting areas at or near the site's epicenter. A detailed analysis of a craft production locus and small chert flake tools reveals insight into the nature of the ancient Maya economy and into models of control over resources.

ANT-P14 Skeletal manifestations of child abuse. L. THOMAS. Department of Anthropology, University of Central Florida 4000 Central Florida Boulevard Phillips Hall Rm. 309 Orlando, FL 32816. Children are at a greater risk for abuse due to their small size and dependency on adults and in some cases this abuse can prove to be fatal. Their small size allows for faster decomposition and in pregnancies, births can be hidden and a child's death could go unnoticed. Often, these deaths are not known until skeletal evidence is discovered. At this point, any incriminating evidence that may have been in the soft tissue is gone or of no use. This is especially relevant in climates that are characterized by heat and humidity or in situations that mimic these conditions. These circumstances favor a faster rate of decomposition and any information that could provide identification of the body as well time, cause and manner of death are lost. Knowledge of bone biology and the repair process can be used to create a timeline for injuries to determine the cause and manner of death. Additionally, it is critical that investigators are familiar with the general and specific patterns of child abuse to differentiate between intentional from non-intentional skeletal trauma. It is also crucial to understand the types of events that mimic child abuse. These events can include accidental injury such a trauma surrounding the process of birth and other injuries naturally occurring in childhood that should not raise suspicions. In addition to accidental injuries, there are several diseases that can imitate abuse. With proper osteological knowledge these diseases can be easily distinguished from intentional trauma.

AOS = ATMOSPHERIC AND OCEANOGRAPHIC SCIENCES |return to top|

AOS-01 Spatial distribution of marine debris on shallow-water reef habitats in the Florida Keys National Marine Sanctuary. M. CHIAPPONE (1,2), L.M. RUTTEN (2) and S.L. MILLER (2). (1) Miami Dade College, 500 College Terrace, Homestead, FL 33030, (2) Center for Marine Science, University of North Carolina-Wilmington, 515 Caribbean Drive, Key Largo, FL 33037. Marine debris, especially lost fishing gear, can destroy benthic organisms and entangle both benthic and mobile fauna. The loss and disposal of fishing gear is internationally recognized as a major environmental issue

and several approaches to reduce debris are advocated. Commercial and recreational fishing are economically important in the Florida Keys, targeting a diversity of fish and invertebrate species using a variety of fishing gears. The ecological effects caused by fishing gear and other marine debris that is lost when cut or broken after snagging on the bottom is a continual concern of resource managers and scientists. During June-September 2008, we employed a stratified random sampling design to quantify the spatial distribution, type, amount, and impacts of marine debris to benthic coral reef organisms at 145 sites along ~190 km of coastline in the Florida Keys National Marine Sanctuary. The sampling domain included five hard-bottom and coral reef habitats from 1-17 m depth, with sampling locations further partitioned into three geographic regions and three management areas: areas open to fishing, those restricted to catch and release fishing by trolling only, and areas closed to fishing. Debris was quantified in four 15-m x 4-m belt transects per site. A total of 686 pieces of debris were recovered from 34,800 m^2 of sampled benthic habitat, with ~443 kg removed. Most of the recovered debris was hook-and-line gear (53%, 0.5 km total length) and lobster/crab trap gear (35%, ~1 km total length). These debris types caused most (94%) of the 448 documented impacts to benthic invertebrates such as corals, gorgonians, and sponges. Statistical differences in debris density among management areas were not detected. Monitoring of marine debris can help to assess compliance and biological effects, but also highlights the challenge to patrolling a large marine protected area.

AOS-02 Biofouling at a static immersion test site in the Indian River Lagoon, Florida. S. LEE, K. ZARGIEL, C. KAVANAGH, and G. SWAIN. Department of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL, 32901. Biofouling data were collected at the Florida Institute of Technology's static immersion test site in the Indian River Lagoon. Recruitment of fouling organisms was monitored on PVC settlement panels over a 30 month period for 30, 60, and 90 day immersion. Panels were exposed in caged (to prevent grazing and predation) and uncaged conditions. The data were analyzed for seasonal variations, panel orientation, length of immersion, and environmental influences. Results provide an understanding of biofouling succession at this location in the Indian River Lagoon.

AOS-03 The *in situ* settlement of seeded pediveligers of the hard clam *Mercenaria mercenaria* into disparate sediments in the Indian River Lagoon, Florida. J.T. RIDGE (1), W.S. ARNOLD (2), S. GEIGER (2), E. IRLANDI (1), and K.B. JOHNSON (1). (1) Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901, (2) Florida FWCC Fish and Wildlife Research Institute, 100 Eighth Avenue SE, St. Petersburg, Florida 33701. Over the past few decades, the Indian River Lagoon, Florida, has seen a shift in the distribution of *Mercenaria mercenaria*. The once widespread hard clam is now found in abundance primarily in the northern areas of the Indian River Lagoon (IRL) system. As a high diversity estuarine system, it is important to understand the mechanisms affecting the distribution of organisms like *M. mercenaria*, which could be acting as a bioindicator of the IRL's habitat quality. The recent discovery of the encysting, toxin producing, dinoflagellate *Pyrodinium bahamense*, abundant through certain areas of the IRL, may be influencing the growth or survivorship of hard clam adults and larvae. As a preliminary exploration of this possibility, this study examines settlement preferences of competent hard clam larvae using sediments of different qualities and from different locations. In addition to differences in the physical qualities of these sediments, they also come from areas either with *Pyrodinium* cysts or none at all. The larval infusion was conducted during October of 2008 within a corral located in the IRL and 24 partitioned sediment trays were used (funding provided by NOAA/TNC). Further processing and future study hope to ascertain the link, if any, between *Pyrodinium* and the declining clam populations of the IRL.

AOS-04 A comparison of metal concentrations among stormwater ponds influenced by different types of land management. N.J.B. SLOAN and E.A. IRLANDI. Department of Marine and Environmental Systems, Florida Institute of Technology, 150 West University Blvd., Melbourne, Fl. 32901. Stormwater ponds are a best management practice used to treat stormwater runoff. Land usage surrounding these man-made aquatic systems accounts for the amounts and types of pollutants which can be found within them. As part of an ongoing study, sediment was collected within ponds (three locations: inlet, middle and outlet) subjected to different land management practices (agricultural, residential, and highway). Sediment was analyzed for copper, zinc and iron concentrations. Metal concentrations were compared to determine if there were significant differences from locations within ponds and/or among ponds affected by different land management practices.

AOS-05 Larval settlement substrate preferences of two species of Balanoid barnacles on Florida's east coast. L.H. SWEAT and K.B. JOHNSON. Department of Marine and Environmental Systems, Florida Institute of Technology, 150 W. Univ. Blvd, Melbourne, FL 32901. The invasive striped barnacle, *Balanus amphitrite*, and the native ivory barnacle, *Balanus eburneus*, are dominant fouling organisms on both natural and artificial substrata in and around the Indian River Lagoon (IRL), Florida. We examined settlement substrate preferences of both species in the field on a range of surfaces.

Microtopography varies widely between these substrata, and may play a role in settlement preference of barnacle cyprid larvae. We deployed settlement panels featuring different types of natural and artificial surfaces at Ponce de Leon Inlet at the north end of the IRL. We determined mean size, percent cover and surface density of *B. amphitrite* and *B. eburneus* recruits after an 8-week period in May and June of 2008. Data suggest that *B. amphitrite* preferred smoother substrata than the local *B. eburneus*. *B. amphitrite* grew larger and had greater percent cover on PVC (0.17 ± 0.04 cm^2 and $46.0\% \pm 4.8\%$, respectively). *B. eburneus* grew larger and had greater percent cover on the rougher oyster, *Crassostrea virginica* (0.05 ± 0.01 cm^2 and $12.2\% \pm 8.6\%$, respectively). These results could indicate a possible pathway for the establishment of the invasive *B. amphitrite*. Substrate preferences among fouling organisms have implications for determining invasion success of non-native foulers, understanding changes in fouling community structure and preventing costly biofouling on ship hulls, intake pipes and other surfaces.

AOS-06 Reassessment of the distribution of fine-grained, organic-rich sediment (a.k.a. muck) in the Indian River Lagoon, Florida. J.H. TREFRY and R.P. TROCINE. Florida Institute of Technology, Melbourne, FL 32901. A 1989 survey of the distribution of fine-grained, organic-rich sediment (a.k.a. muck) in the Indian River Lagoon (IRL) was repeated during 2006 at 73 locations. Fifty-six of the 73 sites sampled in 2006 and 60 of the sites sampled in 1989 contained more than 10 cm of muck. However, 22 of the 73 muck thicknesses from 2006 were > 100 cm whereas only one site contained > 100 cm of muck in 1989. The sum of the total muck thickness for 73 stations in 2006 was 46 m (~63 cm/site) relative to 28 m (~38 cm/site) in 1989. The largest deposits of muck were found in the Intracoastal Waterway and near causeways in more developed areas such as Cocoa and Melbourne as well as near the mouths of some creeks. Despite the sizeable increase, muck most likely still covers < 10% of the bottom of the overall IRL. Although somewhat limited in scope, the observed trend suggests that controlling inputs of suspended matter to the IRL still presents an important environmental challenge.

AOS-07 An examination of possible planktonic *vs*. benthic sources of nematodes colonizing the biofouling community in the Indian River Lagoon, Florida. K.A. ZARGIEL, G.W. SWAIN, and K.B. JOHNSON. Department of Marine and Environmental Systems, Florida Institute of Technology, 150 West University Blvd, Melbourne, FL, 32901. Biofilms will colonize any submerged substratum, natural or artificial. The growth on artificial surfaces can have adverse functional and financial impacts, especially to the shipping industry. Currently, microfouling organisms are being studied at Florida Institute of Technology's static immersion test site in the Indian River Lagoon, where nematodes have been appearing in biofilms in varying abundance. As we continue to investigate the microbial structure of the biofilms, we wonder the source of the nematodes and the influence they have on the surrounding ecology. A study was carried out to determine the origin of the nematodes and their overall contribution to the biofilm community. Samples were collected from four environments: biofilms, the plankton, the water column, and the benthos. The nematode community of all environments varied in abundance and overall composition. Factors that may be causing both temporal and spatial variations include physical, chemical, and biological parameters. Results also suggest nematode sources to the biofilm community are both planktonic and benthic.

AOS Poster

AOS-P15 An examination of January temperature trends across the United States. R.K. SNOW and M.M. SNOW. Applied Aviation Sciences, Embry-Riddle Aeronautical University, 600 S. Clyde Morris Blvd, Daytona Beach, FL 32114. Global warming is perhaps the most serious environmental problem the world community faces today. Extreme precipitation causes flooding in some areas while elsewhere water bodies are evaporating. Tropical diseases are spreading as hurricanes become more destructive. Ice sheets and glaciers are melting, which combined with thermal expansion of the oceans continue to raise world sea levels. Much has been recently written regarding the rapid rise in temperatures across the Arctic, especially during the winter. Using data from the National Climatic Data Center (NCDC) based on the period from 1977 to 2008, average January temperature trends were examined for cities from Florida to Minnesota. At International Falls, January temperatures show an increase of 2.45 degrees Fahrenheit per decade. However, the temperature rise is not limited to high latitude locations. The January temperature at Tallahassee exhibits an increase of 2.18 degrees Fahrenheit per decade while at West Palm Beach the January trend is 1.48 per decade. Even Key West saw an increase in mean January temperatures of 1.11 degrees Fahrenheit per decade. The results suggest diverse regions in the U.S. are experiencing warmer winters similar to those in the Arctic.

BIO = BIOLOGICAL SCIENCES |**return to top**|

BIO-01 Population status of *Acropora* corals in the Florida Keys. M. CHIAPPONE (1,2), L.M. RUTTEN (2) and S.L. MILLER (2). (1) Miami Dade College, 500 College Terrace, Homestead, FL 33030, (2) Center for Marine Science, University of North Carolina-Wilmington, 515 Caribbean Drive, Key Largo, FL 33037. Declines in the population abundances of the reef-building corals *Acropora palmata* and *A. cervicornis* due principally to storm damage, disease, and predation are well documented and perhaps the most significant changes on wider Caribbean reefs since the 1970's. Both coral species were added to the U.S. Endangered Species List in May 2006 as threatened based upon range-wide abundance declines and poor recovery. To ascertain the current status of both corals, a spatially intensive survey of both species was undertaken to determine habitat distribution, colony abundance, size, and condition, first offshore of Key Largo at 107 sites during 2006, followed by a larger-scale survey of 235 sites spanning over 200 km of the Florida Reef Tract in 2007. A two-stage stratified random sampling design incorporated multiple habitats and no-fishing management zones from the inner shelf margin to the deeper (15 m) fore-reef. Four belt transects 15-m x 1 m in dimension yielded data on species presence-absence, colony numbers, size, and condition, as well as data on depth, vertical relief, and the prevalence of *Coralliophila* predation. *A. cervicornis* was more widely distributed among sites and habitats, but less abundant per site, than its congener. *A. cervicornis* was particularly abundant on patch reefs, with a maximum site-level density of 1.22 colonies/m^2 and surface area coverage of 2%. In contrast, *A. palmata* was most abundant on platform shallow spur and groove reefs, with site-level densities up to 1.25 colonies/m^2 and surface area coverage up to 25%. Although the prevalence of disease-like conditions is relatively low, both species continue to suffer tissue damage from damselfishes and corallivorous snails, as well as physical impacts from lost fishing gear. Predicting the future of these two species in Florida requires information about both their present-day ecology and geologic history in the region.

BIO-02 Phase-shift in coral reef communities in the Florida Keys National Marine Sanctuary (FKNMS), USA. R.J. MALIAO, R.G. TURINGAN and J. LIN. Department of Biology, Florida Institute of Technology, 150 W. Univ. Blvd, Melbourne, FL 32901. Characterizing the Florida Keys National Marine Sanctuary (FKNMS), USA, has gained much attention over the past several decades because of apparent changes in the benthic community structure over space and time representative of patterns occurring in the Caribbean region. We used a 5-year dataset (1996-2000) of macroalgal and sponge cover and water quality measurements as predictor variables of hard coral community structure in the FKNMS. The 16 water quality variables were summarized into 4 groups by principal component analysis (PCA). Hierarchical agglomerative cluster analysis of the mean and standard deviation (SD) of the principal component scores of water quality variables separated the reef sites into 2 main groups (and 5 sub-groups), referred to as reefs of similar influence (RSI). The main groups corresponded with their geographical locations within the Florida Keys: the reefs in the Upper and Middle Keys being homogeneous and collectively, having lower water quality scores relative to reefs in the Lower Keys. Canonical correspondence analysis (CCA) between hard coral cover and key predictor variables (*i.e.*, water quality, macroalgal cover and sponge cover) also separated the reefs in the Lower Keys from reefs in the Upper-Middle Keys, consistent with results of the cluster analysis, which categorized reefs based on RSI. These results suggest that the prevailing gradient of predictor variables may have influenced the structuring of coral reef communities at a spatial scale larger than the individual reef. Furthermore, it is conceivable that these predictor variables exerted influence for a long time rather than being a recent event. Results also revealed a pattern showing reduction in hard coral cover and species richness, and subsequent proliferation of macroalgae and sponges during the study period. Our analyses of the Florida Keys present a pattern that is consistent with the characteristics of a reef that has undergone a "phaseshift," a phenomenon that is widely reported in the Caribbean region.

BIO-03 Spatial distribution of marine debris on shallow-water reef habitats in the Florida Keys National Marine Sanctuary. M. CHIAPPONE (1,2), L.M. RUTTEN (2) and S.L. MILLER (2). (1) Miami Dade College, 500 College Terrace, Homestead, FL 33030, (2) Center for Marine Science, University of North Carolina-Wilmington, 515 Caribbean Drive, Key Largo, FL 33037. Marine debris, especially lost fishing gear, can destroy benthic organisms and entangle both benthic and mobile fauna. The loss and disposal of fishing gear is internationally recognized as a major environmental issue and several approaches to reduce debris are advocated. Commercial and recreational fishing are economically important in the Florida Keys, targeting a diversity of fish and invertebrate species using a variety of fishing gears. The ecological effects caused by fishing gear and other marine debris that is lost when cut or broken after snagging on the bottom is a continual concern of resource managers and scientists. During June-September 2008, we employed a stratified random sampling design to quantify the spatial distribution, type, amount, and impacts of marine debris to benthic coral reef organisms at 145 sites along ~190 km of coastline in the Florida Keys National Marine Sanctuary. The sampling domain included five hard-bottom and coral reef habitats from 1-17 m depth, with sampling locations further partitioned into three geographic regions and three management areas: areas open to fishing, those restricted to catch and release fishing by trolling only, and areas closed to fishing. Debris was quantified in four 15-m x 4-m belt transects per site. A total of 686 pieces of debris were

recovered from 34,800 m^2 of sampled benthic habitat, with ~443 kg removed. Most of the recovered debris was hook-and-line gear (53%, 0.5 km total length) and lobster/crab trap gear (35%, ~1 km total length). These debris types caused most (94%) of the 448 documented impacts to benthic invertebrates such as corals, gorgonians, and sponges. Statistical differences in debris density among management areas were not detected. Monitoring of marine debris can help to assess compliance and biological effects, but also highlights the challenge to patrolling a large marine protected area.

BIO-04 Characterization of intertidal oyster beds in the Withlacoochee River and estuary. P.M. DOORIS (1), G.M. DOORIS (1), and D. PIERSON. (1) Dooris & Associates LLC, Brooksville, FL 34603, (2) Stormwater Resources of Florida, LLC, Tampa, FL 33682-7878. In 2008 and early 2009, we mapped the locations of 50 intertidal oyster bars in the Withlacoochee River and estuary. We also determined the average density of oysters per bar, the percentage of live *vs*. dead shells, the length of the longest live and dead shells, and the areas and dimensions of the bars. The 50 oyster bars investigated occurred between a point located approximately 1.0 nautical mile upstream from the river mouth (which was the most upstream occurrence of oysters) to a point located approximately 0.6 nm offshore from the river mouth. The bars could be divided into four types based upon location and nature of substrate: river shoreline bars developed on rocky substrate; river shoreline bars on soft, organic substrate; isolated bars in the river channel on rocky substrate; and offshore bars on sandy substrate. Bars ranged in area from 32 to 917 m^2. Densities ranged from 50/ m2 to 433/m^2. The percentage of live versus dead shells ranged from 17% to 100%. The lengths of the longest live shells ranged up to 12 cm, while those of the dead shells ranged up to 10.1 cm. These data were compared with data collected in similar fashion from the Apalachicola River and estuary and in near shore areas of coastal South Carolina; that comparison will also be presented. (This work was supported by the Southwest Florida Water Management District, Brooksville FL.).

BIO-05 Vertical migrations in *Littorina angulifera* as a result of predator avoidance. M.J. SINGER (1) and W.L. ELLIS (2). (1) Saint Leo University,33701 State Road 52, Saint Leo, Fl 33574, (2) Department of Biology, Saint Leo University, 33701 State Road 52, Saint Leo, Fl 33574. The mangrove periwinkle *Littorina angulifera* is an abundant inhabitant of the mangrove intertidal zone. This semi-terrestrial gastropod grazes on fungal and algal growth on the mangroves and forest floor when the intertidal zone is not covered by water, but migrates up the trees prior to high tide, avoiding submersion. A return to the lower reaches of the mangroves accompanies the retreat of the tide. It has been demonstrated, that the timing of this migration is controlled, in part, by an internal clock, somewhat independent of external stimuli. It is speculated that this behavior is the result of a balance between the need to avoid aquatic predators and the desire to occupy productive feeding grounds. Our study was performed in Tampa Bay, Florida, at a site where *L. angulifera* has access to both mangroves (*Rhizophora mangle* and *Avicennia germinans*) and cordgrass (*Spartina* spp.) as structure that they can utilize for their upward migration. This study investigated the relative influence of proximal stimuli (*e.g*. predation risk) on the extent of upward migration, as well as the factors (*e.g*. water depth) that govern choice of migratory substrate. Our presentation will describe our results to date.

BIO-06 Grooming behaviors of the Hawaiian river shrimp, *Macrobrachium grandimanus*. L.N. VAN MAURIK , J.L. WORTHAM, and M.G. MCRAE. Department of Biology, University of Tampa, 401 W. Kennedy Blvd, Tampa, FL 33606. Many crustaceans expend a great amount of time and energy grooming. Grooming is essential in preventing fouling by sediment and epibionts of important morphological structures. Grooming behaviors include cleaning of structures used in chemoreception, respiration (gills), reproduction, feeding, and general cleaning of the body. When grooming is restricted, organisms can suffer from limited movement, damaged sensory structures, and fouled gills. The Hawaiian river shrimp, *Macrobrachium grandimanus*, is endemic to the Hawaiian Islands and has an amphidromous life-cycle that includes migrations between freshwater and marine habitats. There is very little behavioral research focusing on *M. grandimanus*, and none regarding their grooming behaviors. Due to their migratory life cycle, this species is exposed to environmental pressures that may increase the need for grooming. All grooming behaviors for *M. grandimanus* were recorded during a thirty minute time period for each individual in 2008. We hypothesized that one region of the body will be groomed more than the other, indicating an area of sensory input priority. All grooming behaviors were documented in terms of their frequency and time duration. Statistical analyses were conducted to determine if there was a relationship between size of individuals and grooming behaviors as well as frequency of body regions groomed. The two main grooming appendages used in this species were the third maxilliped and the first pereiopod. Body regions groomed the most frequently were the antennae, antennules, eyes, carapace, walking legs, and maxillipeds.

BIO-07 Situational cannibalism in *Luidia clathrata* (Echinodermata: Asteroidea). J.M. LAWRENCE (1), J.C. COBB (2), T. TALBOT-OLIVER (1) and L.R. PLANK (1). (1) Department of Biology, University of South Florida, Tampa, FL 33620, (2) Fish and Wildlife Research Institute, St. Petersburg, FL 33701. *Luidia clathrata* at a field site in Tampa Bay (27°55'N, 83°35'W) were sampled over multiple days to calculate density. Of 427 one-m^2 quadrats 46.8% had no individuals, 29.5% had one, 19.2% had two, 4.0% had three and 0.5% had four individuals. Average weighted density from all quadrats was 0.82 individuals m^{-2}. This indicates the individuals were dispersed. Eight individuals (R = 7-8 cm) held one week in a 0.120 m^2 aquarium did not overlap (N = 8) and did not interact. After one week, amputation of an arm from an individual resulted in immediate attack by intact individuals. Attack was stopped by amputating an arm from all individuals. Attack did not occur when the individuals were exposed to bright light. *L. clathrata* in aquaria are not only cannibalistic on wounded individuals but also scavenge decayed fragments. In the field cannibalism was recorded in four out of five trials. During each trial, three arms were amputated from an individual that was then positioned in close proximity to two or more undisturbed intact individuals. Responses of the intact individuals were recorded on digital video for a minimum of five minutes. Some intact *L. clathrata* attacked individuals with amputated arms while others fled. Cannibalism by *L. clathrata* depends on the state of the individual, whether the individual is intact or wounded and probably on hunger level.

BIO-08 Effect of number of arm loss on amount of arm regeneration in *Luidia clathrata* (Echinodermata: Asteroidea). J.M. LAWRENCE (1), J.C. COBB (2), T. TALBOT-OLIVER (1) and L.R. PLANK (1). (1) Department of Biology, University of South Florida, Tampa, FL 33620, (2) Fish and Wildlife Research Institute, St. Petersburg, FL 33701. The effect of number of arm loss on amount of arm regeneration in stellate echinoderms is controversial. Reports have indicated that an increase in number of arm loss decreases the amount of regeneration per arm but increases the amount per individual, increases the amount of regeneration per arm and increases the amount per individual, or has no effect on the amount of regeneration per arm and increases the amount per individual. We amputated one or three arms near the disc from Luidia clathrata. They were starved to avoid possible difference in amount of food consumed with number of arms lost. After 83 days the length, dry weight and amount of organic matter per arm of individuals with one regenerating arm was significantly less than those of individuals with three regenerating arms, indicating that under the conditions of this experiment the rate of arm regeneration was not independent of number of arms regenerating. Since the animals were starved, regeneration was supported by nutrient reserves in the body. The dry weight of the pyloric caeca per intact arm decreased more in individuals regenerating three arms than one. The dry weight of the pyloric caeca per arm did not decrease significantly from initial amounts in individuals regenerating one arm but did decrease significantly in those regenerating three arms.

BIO-09 Brittlestars with a bite: a new kind of pedicellaria in echinoderms. R.L. TURNER and J.M. BOUCHER. Department of Biological Sciences, Florida Institute of Technology, 150 W. University Blvd., Melbourne FL 32901. Pedicellariae are minute grasping organs of sea urchins and sea stars. Although there are many kinds of pedicellaria in both classes, all consist of at least two modified spines (valves) that articulate on a base (either a plate or a pedicel) and that oppose each other to grasp foreign particles, whether prey, enemy, or clutter. Here we describe a new kind of pedicellaria from five gorgonocephalid ophiuroids: *Asteroporpa annulata*, *Astracme mucronatus*, *Astrocnida isidis*, *Astrocyclus caecilia*, and *Astrophyton muricatum*. In these species, the pedicellaria consists of several valves (formerly called hooklets) arranged in two opposing rows on a base plate on the dorsal surface of the terminal arm segments. Each valve articulates on a tubercle that has a central pore (presumably for insertion of ligaments), a broad medial region of relatively imperforate stereom (as a bearing surface), and a peripheral region of labyrinthic stereom (probably for attachment of muscle). Valves are not directly opposite each other but slightly offset, giving the appearance of a claw clip used in hairstyling. The manner in which valves overlap might give the same effect as crossed pedicellariae in asteroids. The association of the ossicles with soft tissues is not yet known for species named above. Valves and tubercles have been known for gorgonocephalids over the last 130 years, and the valves have been illustrated for many species. The aggregation of tubercles and valves on base plates until now was reported only for *Astrtotoma agassizii* by Dearborn et al. (1986), who also illustrated presumed muscles for elevation of the valves. This type of pedicellaria is a synapomorphy of the ophiuroid family Gorgonocephalidae, but among echinoderms pedicellariae probably have evolved independently at least three times.

BIO-10 Versatility of feeding mechanisms in Florida marine teleost fishes. R.G. TURINGAN. Department of Biological Sciences, Florida Institute of Technology, 150 West University Boulevard, Melbourne, FL 32901. Trophic polymorphism is well documented in freshwater fishes, but intraspecific variation in feeding functional morphology and the underlying mechanisms that shape intraspecific diversity in form and function in marine fishes are less understood. This study synthesizes our laboratory investigations of the link between functional design of the feeding mechanism and prey-

resource use within populations of Florida marine fishes. It also tests the hypothesis that change in the growth of key feeding muscles and bones is induced by feeding on different prey types. Fishes that exploit clams, crabs, and other hard-shelled invertebrates as food have more robust feeding bones and muscles, as well as higher jaw-mechanical advantage. In contrast, fishes that eat polychaetes and other soft-bodied prey, as well as seagrass and fleshy algae have smaller feeding muscles and bones relative to their durophagous conspecifics. A diet-rearing experiment confirmed that the development of robust feeding bones and muscles is enhanced by durophagy. Results of these studies underscore the importance of intraspecific ecomorphological variation in shaping phenotypic diversity in Florida coastal-marine fishes.

BIO-11 Stage-specific effects of temperature on the feeding behavior of the invasive Pike Killifish in Florida. J.R. KERFOOT and R.G. TURINGAN. Department of Biology, Florida Institute of Technology, 150 W. Univ. Blvd., Melbourne, FL 32901. The ability of an invasive fish to utilize an available food resource influences its growth and subsequent survival in an invaded ecosystem. It is hypothesized that feeding is affected by ambient temperature. This is the first study to investigate the effect of temperature on the prey-capture kinematics through ontogeny in an invasive species. It addresses two questions: (1) Does temperature influence the feeding behavior and prey-capture kinematics of the invasive pike killifish, *Belonesox belizanus*? and (2) Does the effect of temperature in this species vary through ontogeny? To address these questions, three individuals in each size class, neonate (< 25 mm standard length [SL]), juvenile (25 mm < SL > 55 mm) and adults [> 55 mm SL]) were filmed in 45 L experimental tanks feeding on adult *Artemia* sp. or *Gambusia holbrooki* at two different temperature regimes, 20°C and 30°C. Each individual was filmed three times at each temperature, yielding 54 films analyzed. Prey-capture velocity, peak gape velocity, and Q10 were compared among life-history stages using ANOVA. At both temperature regimes, juveniles significantly finished their feeding bout (*i.e.*, greatest prey-capture velocity) and reached peak gape fastest relative to the neonates and adults. The Q_{10} values were 1.167-1.342 for prey-capture velocity and 1.247-1.425 for peak gape velocity, but were not significantly different among life-history stages. Results reveal that the effect of temperature on prey-capture kinematics and feeding behavior is stage-specific. This study suggests that in examining how temperature influences the rate and range of spread of an exotic species in Florida one must address the different stages in the life history of the target species.

BIO-12 Gastrointestinal parasites of selected tropical pelagic elasmobranchs and mesopelagic teleosts. M. TAYLOR (1), H. LAUBACH (2), and D.W. KERSTETTER (1). (1) Nova Southeastern University Oceanographic Center 8000 North Ocean Drive Dania Beach, FL 33004, (2) College of Medical Sciences, 3200 South University Drive, Ft. Lauderdale, FL 33328. Natural mortality is a poorly known aspect of fisheries biology, despite its importance in stock assessments and population analysis. Of the many potential sources of mortality and morbidity in fishes, the effects of gastrointestinal parasites is perhaps the least studied. Parasite loads in the elasmobranch spiral valve and teleost fish gastrointestinal tract may both inhibit nutrient uptake and stimulate an inflammatory response in the host. The gastrointestinal parasites of several tropical pelagic elasmobranchs including dusky, silky, and night sharks (Carcharhinus obscurus, *C. falciformis*, and *C. signatus*), the pelagic stingray (*Pteroplatytrygon violacea*) and the mesopelagic fishes snake mackerel (Gempylus serpens), oilfish (Ruvettus pretiosus), and escolar (*Lepidocybium flavobrunneum)* are described from the South Atlantic Bight in the western North Atlantic. Species found to date include nematodes, trematodes and cestodes, and their potential transmission vectors are being explored. Total gastrointestinal parasite loads are compared against the size (length and weight) of the host, showing no relationship for pelagic elasmobranchs and only a weak relationship for mesopelagic teleosts. To date, 60 elasmobranch specimens have been sampled with a yield of approximately five parasites and approximately 20 mesopelagic teleosts have been sampled, yielding approximately 80 total parasites, the majority being nematodes.

BIO-13 Use of pop-up satellite archival tags to determine habitat utilization of sailfish (*Istiophorus platypterus*) in the southern Gulf of Mexico. D.W. KERSTETTER. Nova Southeastern University Oceanographic Center, 8000 N. Ocean Dr., Dania Beach, FL 33004. To determine habitat utilization of sailfish in the southern Gulf of Mexico and Florida Straits, 18 pop-up satellite archival tags were deployed on animals incidentally captured during regular commercial pelagic longline fishing operations targeting swordfish and tunas. Tags were programmed for a 10-day deployment period, with point measurements of depth, temperature, and light level every 90 seconds. A total of 17 tags transmitted following the full deployment period, transmitting 25-82% of the archived data; three tags were also physically returned, allowing for 100% recovery of the archived data. The data recorded by the tags showed repeated short-duration movements throughout the deployment period to depths greater than 75 m for less than five minutes each, presumably for feeding. Diel differences in depth distributions and individual movement patterns are examined, including differences in habitat utilization in relation to the local mixed layer depth. The maximum depths of the short-duration movements are also well below the measured

effective fishing depths of the common types of pelagic longline fishing gear used in this geographic area. The results suggest that recent efforts to reduce domestic fisheries interactions with sailfish by deploying pelagic longline fishing gear below the depths frequented by this species may be counterproductive and that other bycatch reduction methods should be explored.

BIO-14 The potential role of ALK-1 growth-factor receptor in angiogenesis. I. DUFFY (1), A. CURRY (1) and J. HAWKER (2). (1) Dept. of Math and Science, Saint Leo University, PO BOX 6665, Saint Leo, Fl, 33574, (2) Dept. of Chemistry and Biochemistry, Florida State University, Tallahassee, FL 32306. Cancer and heart disease are amongst the leading causes of death in the USA. To become malignant tumors must induce a new blood vessel supply, *i.e*., tumor angiogenesis, for tumor growth and metastasis. Blood flow through the heart is diminished, often fatally, in patients with heart disease, but may be restored by augmenting angiogenesis, or new blood vessel formation, in the heart. Growth factors and their receptors may coordinately regulate different stages of angiogenesis. Activin-Like Receptor Kinase 1(ALK-1), a type I Ser/Thr kinase receptor of the transforming growth factor beta (TGFβ) family, which is predominantly expressed in endothelial cells (EC) and blood vessels, may play a role in blood vessel formation and structure. Our aims are to show that ALK-1 is expressed in coronary venular endothelial cells (CVEC) and that TGFβ signals through ALK-1, to show that ALK-1 is required for angiogenesis, and to identify the genes regulated by ALK-1 in endothelial cells.

BIO-15 Behavioral and morphological changes of mosquito larvae when introduced to *Cylindrospermopsis raciborskii* (CYN) cells. N.S. HELAL and D. STOCK. Department of Biology, Stetson University, 421 North Woodland Blvd, Deland, Fl 32723. The effect of CYN on smaller organisms such as mosquito larvae (*Anopheles culex*) has not yet been examined. We hypothesized that the cyanobacteria would have a fatal effect on the larvae with the largest number of deaths being in the group with the highest concentration of CYN. The CYN we used was collected from Lake Dora in Mount Dora, Florida while the mosquito larvae were collected in DeLand and Port Orange, Fl. Three experimental groups were used in which different cell concentrations of CYN were placed in water (106, 104, 102 cells/ml). Our control was dechlorinated water without CYN cells. After placing the larvae into the water containing CYN we observed behavioral changes over a three day period. The behaviors observed were the number of movements in 30 seconds and the time required for the larvae to float from the bottom of the dish to the surface of the water. On the third day we recorded the behavioral responses as well as morphological changes in head width and body length of the larvae. Death occurred in both the experimental and control groups. Based on this result we concluded that CYN does not appear to have an effect on the larvae. However, this result may be due to the fact that the sample size was only 15 larvae per experimental group. We feel increasing the sample size will give us a different result, in that we would be able to accept our hypothesis. Further experimentation will be conducted.

BIO-16 Pollen as a tool for tracking stable flies. D.M. JARZEN (1) and J.A. HOGSETTE (2). (1) Paleobotany and Palynology Laboratory, Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611-7800, (2) U.S. Department of Agriculture, Agricultural Research Service, Center for Medical, Agricultural, and Veterinary Entomology, Gainesville, Florida 32608. The stable fly, (*Stomoxys calcitrans* L.), is an important pest of humans and livestock in many parts of the world. Its immature stages develop in decaying vegetation, e.g. hay, silage, feed, mulch and grass clippings, in agricultural and urban areas. Although both sexes are obligate blood feeders, this fly uses nectar from flowers as an energy source for local and long distance flight. Pollen from these flowers becomes attached to the nectar-feeding flies, which thereby indicates which herbaceous plants or trees the flies have visited and, at times, the route used by the flies to arrive at their point of capture. Stable flies collected on sticky traps at the University of Florida Horse Teaching Unit (HTU) in March, 2008, were examined for the presence of pollen adhering to their exoskeletons. The pollen was recovered and identified as Carolina willow, *Salix caroliniana* Michaux 1803. This small shrub or tree is common throughout Florida primarily in wetland areas. Carolina willow was blooming at the HTU when the flies were captured, so it was impossible to determine whether the pollen on the flies was from on-site Carolina willows or from the many Carolina willows on Paynes Prairie to the south.

BIO-17 Effects of seed dispersal and proximity to other vegetation on the distribution of an endangered, endemic perennial, *Asclepias curtissii*. P. MONDO and C. C. BENNINGTON. Department of Biology, Stetson University, 421 N. Woodland Blvd, DeLand, FL 32723. Curtiss' milkweed (*Asclepias curtissii*) is an endangered perennial herbaceous plant endemic to Florida scrub habitat. Although many scrub perennials are gap specialists, *A. curtissii* is often found growing in close association with woody vegetation. We asked whether seedlings benefit from growing in the shade of larger plants. One hundred forty-four seedlings were planted into a total of 12 3 × 2 m fenced plots within Lyonia Preserve, Deltona, FL.

Within each plot, six seedlings were planted in sandy gaps and six were planted in close association with existing shrubs. We measured growth and survival over a 5 month period. To determine whether seed dispersal patterns contribute to the current distribution of plants we released 60 milkweed seeds and recorded the distance from the spot where they landed to the nearest shrub stem and compared this to the distance between random points and shrub stems. We found that seedlings growing in the shade of shrubs were significantly taller ($p = 0.001$) and had significantly higher rates of survival ($p = 0.02$) than those seedlings planted in gaps. In the dispersal experiment, seeds were no more likely to land near a shrub than would be expected by chance ($p = 0.49$). The nurse plant phenomenon, in which an association with larger plants facilitates seedling growth and survival, has been documented in other arid environments, but not previously in Florida scrub.

BIO-18 Restoration of aguajales (*Mauritia flexuosa*), palm swamps in Amazonian Peru. C.J. MILLER. Environmental Science and Biology, Saint Leo University, P.O. Box 6665, MC 2127, Saint Leo, FL 33574-6665. The aguaje palm is an economically important tree that occurs throughout the Amazon Basin. The palm is used by people for thatch, fibers, several minor products, and most importantly fruit, which is mostly harvested for regional and local markets. This species is not only important to people, but is a key resource for wildlife, including many arboreal and terrestrial mammals and birds. In the Iquitos region of Peru (Loreto province), many aguajales (palm swamps) have been damaged due to destructive harvesting practices of aguaje for its fruit. Predatory harvesting has resulted in the planting of the palm in agroforestry systems as a means of reducing harvesting pressure on wild resources. However, the intended use of fruits in agroforestry gardens is for humans, and these systems do not address the maintenance of the resource for wildlife. In this paper, the author examines the potential restoration of damaged aguajales in order to restore an important resource for wildlife. It is hypothesized that restoration of the aguajales also will restore hydrologic flows to areas that are invaded by hardwood trees where transpiration by hardwood trees has caused palm swamps to become drier.

BIO-19 Wetland habitat, landscape elements, and the management of introduced treefrogs in Florida. J.T. IPOCK (1), T.S. CAMPBELL (1) and K.R. CAMPBELL (2). (1) Dept. of Biology, University of Tampa, 401 W. Kennedy Blvd., Tampa, FL 33606, (2) ENVIRON International Corp., 10150 Highland Manor Drive, Suite 440, Tampa, Florida 33610. Florida's native treefrog populations suffer from synergistic interactions between habitat alteration, groundwater withdrawals, and myriad aquatic and terrestrial introduced species. The Cuban treefrog (*Osteopilus septentrionalis*), now the largest treefrog in North America, affects tadpole and adult stages of native treefrogs via competition and predation. In June 2006, we initiated a field experiment at Morris Bridge Wellfield in northeastern Hillsborough County to determine whether or not regular removals of Cuban treefrogs would be an effective management option. We used capture-mark-recapture methods to study treefrog populations in PVC pipe refugia deployed around 24 hydrologically isolated wetlands (12 marsh; 12 cypress). After collecting background data on all treefrogs for two years, we began removing Cuban treefrogs from half of the wetlands in June 2008. To determine the influence of adjacent microhabitat and surrounding landscape elements on the efficacy of the removals, we conducted vegetation surveys around each pipe and in the upland matrix surrounding each wetland. A total of 585 Cuban treefrogs have been removed from the 12 treatment wetlands to date. Recapture rates of marked Cuban treefrogs declined rapidly, and none were recaptured in the treatment wetlands after four months, indicating the treatment wetlands (or at least the PVC refugia) served as effective population sinks. Cuban treefrog body size also decreased rapidly in the treatment wetlands; a hallmark of an exploited population. Thus, removals had a dramatic effect on Cuban treefrog populations after only six months. More importantly, preliminary results indicate native treefrog abundance and recapture rates have increased in the treatment wetlands. The magnitude of these effects depended on the microhabitat immediately surrounding the pipe and varied with the landscape elements in the surrounding upland matrix. This study illustrates how even some of the most abundant and seemingly unmanageable introduced species might be effectively managed with relatively simple methods.

BIO-20 The benthic macroinvertebrate community of wetlands in a West-Central Florida natural area. S.M. NELSON (1), K.R. CAMPBELL (2), and T.S. CAMPBELL (1). (1) Department of Biology, University of Tampa, 401 West Kennedy Blvd, Tampa, FL 33606, (2) ENVIRON International Corp., 10150 Highland Manor Drive, Suite 440, Tampa, FL 33610. We have been studying amphibian populations in four types of wetlands (borrow pits, marshes, isolated cypress wetlands, and riverine swamps) at a natural area owned by the Southwest Florida Water Management District in West-Central Florida since 2004, when large populations of introduced Cuban treefrogs (*Osteopilus septentrionalis*) were discovered. The Morris Bridge Wellfield, managed by Tampa Bay Water, and Hillsborough County's Flatwoods Park are located within the study area. Our study, which has included various tasks, was initiated to determine the distribution, abundance, and impacts of Cuban treefrogs; to determine if their populations could be reduced by removing them from PVC pipes installed around wetlands; and to determine if these removals would benefit native amphibians. During the summer

breeding season, tadpole surveys are conducted, which includes the collection of tadpoles, benthic macroinvertebrates, and fish. From 2006 through 2008, we collected benthic macroinvertebrates from five borrow pits, 18 marshes, eight cypress wetlands, and three riverine swamps. Marshes contained the highest number of benthic macroinvertebrate taxa (32), while riverine swamps contained the least (16 taxa). For the past three years, aquatic earthworms have been collected only from borrow pits; amphipods and *Thermonectus* sp., a dytiscid, have been collected only from cypress wetlands; and *Berusus* sp., a hydrophilid, have been collected only from marshes. In the four borrow pits that were sampled from 2006 through 2008, libellulids, damselflies, and backswimmers were the most common taxa found all three years. In the ten marshes that were sampled, crayfish, aeshnids, and *Hydrocanthus*, a hydrophilid, were the most common taxa found all three years. Due to drought conditions, three years of data are available for only one cypress wetland and no riverine swamps. Backswimmers and mayflies were the most common taxa found in the one cypress wetland surveyed from 2006 through 2008.

BIO-21 An integrated assessment and ecosystem management protocol for decision making in coastal habitats. M.A. REITER (1), J.H. GENTILE (2), and M.H. HARWELL (2). (1) Environmental Science, Bethune-Cookman University, Daytona Beach, FL 32114, (2) Harwell, Gentile and Associates LLC, 98 Moss Lane, Brewster, MA 02631. Conceptual modeling methods such as Valued Ecosystem Component (VEC) and Four-Component (4C) modeling have provided resource managers with useful tools for evaluating cause-effect relationships and potential risks in an ecosystem. However, the growing interest in integrated assessment as a means of identifying environmental risks and developing management strategies has highlighted the need for a procedure that can combine scientific data, social and economic inputs, and management constraints so that they can be used to make management decisions. The NOAA-sponsored Environmental Cooperative Science Center (ECSC) has utilized conceptual modeling as the foundation of an integrated assessment and ecosystem management protocol (IAEMP) that allows coastal resource managers to move from a graphical picture of hypotheses for the behavior of the system of concern based on both scientific and non-scientific information to a series of forecast scenarios that can be analyzed for potential adherence to management goals. The subset of scenarios that fit management goals can then be evaluated based on management constraints in order to select the "best" scenario for developing a management action. The management action is implemented as part of an adaptive management process, allowing the manager to evaluate the management action and, if necessary, refine the action or the models (or both) in order to improve the outcome of future management actions and scenarios. The protocol will be discussed with reference to a demonstration involving the impact of salinity and river flow changes on oysters in Apalachicola Bay in Florida.

BIO-22 Assessing the validity and reliability of optical model predictions used in setting water quality targets in Lemon Bay, Charlotte Harbor and Estero Bay, Florida. M. WESSEL (1) and C. CORBETT (2). (1) Janicki Environmental, Inc. 1155 Eden Isle Dr NE, St. Petersburg, Fl. 33704, (2) Charlotte Harbor National Estuary Program (formerly), 1926 Victoria Avenue, Fort Myers, FL 33901. The Charlotte Harbor National Estuary Program has pursued the development and implementation of natural resource based water quality targets as an evaluation tool for making science based management decisions. A method for deriving water quality targets using the light requirements of seagrass and a locally derived optical model (Corbett and Hale 2006) has been an important step in achieving this goal. This study furthers the development of the water quality targets by comparing the optical model predictions in relation to empirical data collected on light attenuation concurrent with the water quality used to drive model predictions. The study assessed the agreement between model based and empirical estimates with respect to target exceedances and used residual analysis and computer simulation to judge the validity and reliability of the model predictions against the empirical data. Results suggested that for many areas the model based estimates were in good agreement with the empirical data; however, in some areas the model seemed to either over predict or under predict the light attenuation observed in the field. These areas tended to be where the interaction of coastal water from the Gulf of Mexico and discharge from tidal rivers was most pronounced.

BIO-23 Potential drivers impacting the endemic snail populations of Blue Spring, Volusia County FL. C.J. BLEASDALE (1), M.A. REITER (2), and A.J. BROOKS-WALTER (2). (1) Biology, Stetson University, DeLand, FL 32724, (2) Environmental Science, Bethune-Cookman University, Daytona Beach, FL 32114. By virtue of its historic overall quality, relative isolation, and continuous water outflow, Blue Spring in Orange City FL has become home to the rare endemic Blue Spring Pygmy Siltsnail (*Floridobia parva*) and Blue Spring Hydrobe (*Aphaostracon asthenes*). The Hydrobe is a threatened species and both are candidates for federal listing, with some evidence of vulnerability but with limited data to justify listing. Recent surveys indicate that the snails are present in lower densities and with narrower distributions when compared to 1992-1993 data. Potential explanations for this observation include a lack of the snails' apparent preferred habitat (long algal filaments) and inhibition of the development of new refuge areas for the snails, making it important to identify changes to the system that may have lead to these declines. One possibility is the increase in manatee numbers as

well as the introduction of exotic species such as the Vermiculated Sailfin Catfish (*Pterygoplichthys disjunctivus*), which use the algal filaments as a food source. There is also evidence suggesting chemical changes to the waters of Blue Spring and the St. John's River from direct spilling or dumping, runoff and flow rate changes from land use in the recharge basin, and/or seepage of chemicals into the groundwater source for Blue Spring. Considering the decline in population since the 1992-1993 survey, the three questions we seek to answer are: what are the potential explanations for the apparent decline in the spring's population of *F. parva* and *A. asthenes*, to what degree have external drivers added since 1992 degraded the available habitat of Blue Spring, and what are/were these drivers?

BIO-24 A survey of the endemic snail populations of Blue Spring in response to habitat degradation. C.K. JNBAPTISTE, M.A. REITER, and A. BROOKS-WALTER. Environmental Science, Bethune-Cookman University, Daytona Beach, FL 32114. Blue Spring in Orange City FL produces a picturesque run of clear 73°F water that flows into the St. Johns River. By virtue of its overall quality, the spring's relative isolation, and the continuous water outflow, Blue Spring has become home to the rare Blue Spring Pygmy Siltsnail (*Floridobia parva*) and Blue Spring Hydrobe (*Aphaostracon asthenes*). These snails have adapted to the dynamics of this unique environment and are endemic to the habitat. The Hydrobe is a threatened species and both are candidates for federal listing, with some evidence of vulnerability but with limited data to justify listing. Due to recent declines in outflow and water quality in the spring, along with the introduction of exotic species such as the Vermiculated Sailfin Catfish (*Pterygoplichthys disjunctivus*), we have performed surveys of the snails' density and abundance relative to similar surveys performed in 1992-1993 to assess the possibility that the already constrained communities have been negatively impacted. Standard area substrate and filamentous samples were taken via snorkeling, and the snail populations evaluated and counted by eye and with hand lenses and microscopes. In comparison to 1992-1993 data, the results to date indicate that the snails are present in lower densities and with narrower distributions. Potential explanations for this observation include a lack of the snails' apparent preferred habitat (long algal filaments) and inhibition of the development of new refuge areas for the snails.

BIO-25 Recolonization of Blue Spring Run by the Blue Spring Hydrobe (*Aphaostracon asthenes*) after Hurricane Fay. R.J. MOSS. M.A. REITER, and A.J. BROOKS-WALTER. Environmental Science, Bethune-Cookman University, Daytona Beach, FL 32114. The Blue Spring Hydrobe (*Aphaostracon asthenes*) has been documented in studies from 1992 and 2008 to prefer specific habitat types (particularly long algal filaments) and locations within the run, and is absent from most locations easily accessible to humans, manatees (*Trichechus manatus latirostris*), and the Vermiculated Sailfin Catfish (*Pterygoplichthys disjunctivus*). Hurricane Fay, which moved into the Blue Spring area on August 21, 2008 releasing approximately 20 inches of rainfall, forced the closure of the swimming area (where previous sampling had shown an absence of snails) due to flooding. Since large numbers of manatees and catfish had not yet entered the run and there was a localized snail population previously detected near the swimming dock, the closure presented the opportunity to observe the snail's ability to recolonize previously unoccupied areas due to drift from upstream and/or dispersion from the nearby localized population. Sampling was performed in the lower swimming area and on the dock, steps, and substrate 36 days (when access was granted) through 50 days after the closure. Without inhibiting factors present, algal filaments began to recolonize the substrate of the closed swimming area and we found snails at densities of approximately 30 individuals per 200 cm^2 as far away as two m from the population. Decreasing densities of snails were detected on the submerged stairs as one moved farther away from the substrate and the existing localized population. However, a cold snap occurring 57 days after closure resulted in the appearance of manatees and sail-fin catfish, and samples after that point found no algae or snails in the previously newly colonized locations. No snails were found on the submerged dock surface during the sampling period, which would have been more likely to be colonized by drift from upstream. This study suggest that there is potential for dispersive recolonization from existing localized populations if the algal habitat were allowed to reform, but no evidence of meaningful drift colonization from upstream was detected.

BIO-26 Use of mitochondrial DNA to estimate divergence times for populations of the springsnail *Floridobia floridana* from central Florida, USA. J.K. TOKARZ, and A.S. SCHULTHEIS, Dept. of Biology, Stetson University, 421 N. Woodland Blvd. Unit 8264, DeLand, FL 32723. In Florida, changes in sea level associated with cycles of glacial and interglacial periods are thought to be the dominant historical force affecting the geographic distribution and rate of population divergence of hydrobiid springsnails. The purpose of this study was to measure genetic divergence among populations of *Floridobia floridana* from central Florida using portions of the mitochondrial genes cytochrome oxidase I (COI) and NADH dehydrogenase I (NDI) as genetic markers to estimate divergence times. A total of 548 bp of COI data in 23 individuals from six locations were sequenced. An additional 500 bp of NDI data in 12 of these individuals from four locations was also

sequenced. A BLAST search of the COI data indicated that *F. floridana* was sampled from only three of the six locations. All other specimens belonged to one of four other species: *F. winkleyi*, *F. petrifons*, *F. mica*, and *Amnicola limosa*. Phylogenetic analysis of COI data indicated the presence of two clades (the *winkleyi* and *floridana*/*mica*/*petrifons* clades). Species within the *floridana*/*mica*/*petrifons* clade exhibited percent sequence divergence values of less than 2%. This level of genetic differentiation is typically seen among populations, indicating *F. floridana*, *F. mica* and *F. petrifons* may not be valid species. Therefore, they were further analyzed using population genetic analysis. A haplotype network constructed using combined COI and NDI data from 12 individuals within the *floridana*/*mica*/*petrifons* clade showed eight unique haplotypes with 0.095% to 1.91% sequence divergence. Divergence times estimated using a molecular clock indicate that members of the *floridana*/*mica*/*petrifons* clade diverged from one another 0-0.788 million years ago. While all data to this point suggest low genetic divergence in association with recent divergence, an analysis of molecular variance (AMOVA) indicated high levels of genetic differentiation associated with low gene flow between populations ($\Phi st = 0.918$). However, high Φst values were likely the result of low sample size.

BIO Posters

BIO-P16 Assessing disturbances to beach-nesting birds at public beaches in Pinellas County, Florida. H.H. BOLINT, A.A. ORMSBY, and E.A. FORYS. Eckerd College, 4200 54th Ave. S., St. Petersburg, FL 33711. Five beaches along the Gulf Coast of Pinellas County, Florida, were monitored for disturbances to beach-nesting birds during the summer of 2008. A walking survey of each beach was conducted to record disturbances or threats that could manipulate site preferences and long-term survival of beach-nesting birds. There was an association between the number of people and laughing gulls using the same beaches. Laughing gulls are considered a known predator of the eggs and chicks of beach-nesting birds, and were most frequently found at Clearwater Beach which also had the highest number of people. Correspondingly, the highest number of directly human-caused disturbances per kilometer was recorded at Clearwater. Overall, Indian Shores had the highest number of total disturbances per kilometer (human disturbances and natural predators). Treasure Island had the highest recording of fish crows, most likely due to the abundance of Australian Pine trees along the beach, while Clearwater had the highest recording of dogs, presumably because of its unclear policies regarding pet usage of the beach. Fish crows present similar threats to a beach-nesting bird colony as laughing gulls, but a dog can destroy an entire colony by trampling the eggs and chicks and attacking the adults. In order to make these beaches desireable and safe places for beach-nesting birds to colonize, there must be an increased effort to educate the public about their importance to Pinellas County's biodiversity. Changes must also be made by each beach's managers so that they may better regulate and oversee the beaches in order to allow humans and the birds that nest there to coexist peacefully. (Thank you to Florida Fish and Wildlife Conservation Commission for the funding of this project, and thank you to Tony Henner for contributing in data collection.)

BIO-P17 Near-shore water quality and seagrass depth limits in upper Tampa Bay, Florida. J.O.R. JOHANSSON, W.M. AVERY, K.B. HENNENFENT and J.J. PACOWTA. Bay Study Group, City of Tampa, 2700 Maritime Blvd, Tampa, FL 33605. Periodic setbacks occur in Tampa Bay seagrass coverage following periods of prolonged rainfall. The setbacks are not unexpected because the increased rainfall causes high tributary discharges of dissolved and particulate matter that affect the light climate of bay waters. However, several near-shore and shallow *Halodule wrightii* meadows in the upper areas of the bay, many bordering mangrove and salt marshes, have been stagnant or shown very limited expansion for a decade or longer; a time which has included both dry and wet periods. Light availability at the deep edge of these near-shore *H. wrightii* meadows, estimated from an optical model, appears to average about 50 to 60% of surface incident (Io) photosynthetically available radiation (PAR). This light level would appear sufficient for the meadows to grow and expand into deeper waters. In contrast, deep edges of *H. wrightii* meadows that are temporarily established during extended dry periods, which are located near the offshore edge of the estuarine shelf, receive lower average light levels of about 30 to 40% Io. A three year and still ongoing study of shallow water quality in southeastern Hillsborough Bay shows that CDOM absorbance is consistently higher in waters above the near-shore seagrass bed than in waters above the offshore meadows. Chlorophyll and turbidity generally show increasing trends with distance from shore. Results from the study suggest that reductions of important light energy in the shallow area from relatively high CDOM absorbance, in addition to losses caused by phytoplankton, other particulate matter, and epiphytes may limit the near-shore meadows to the shallow depths they currently inhabit. We also plan to explore, through field measurements and bio-optical modeling, if light availability expressed as photosynthetically usable radiation (PUR), which accounts for spectrum weighted energy requirements of the seagrass, will help us better understand why the near-shore *H. wrightii* meadows are stagnant.

BIO-P18 High resolution digital imagery reveals hard bottom features of the Springs Coast. K.V. KOLASA. Southwest Florida Water Management District, Brooksville, FL 34604. Digital imagery (1 ft resolution) was collected for the Florida Springs Coast (70 mile stretch of coastline north of Tampa Bay) in April 2007 for the purpose of mapping the extensive seagrass beds of this region. This was the first time high resolution digital imagery was obtained for this region. The new imagery provided improvements in positional accuracy, image resolution and clarity, enhanced detail of seagrass density, and overall improvements in seagrass mapping accuracy. During the seagrass mapping project the digital imagery was reviewed for its potential to map hard bottom habitat which is the second most abundant benthic habitat along the Springs Coast. Hard bottom is characterized as mixed communities of macroalgae, sponges, octocorals, and stony corals. Areas containing dense stands of sponge, coral, and rock out-croppings can provide habitat to hundreds of species of invertebrates. Previous efforts to map hard bottom using conventional film imagery in the 1980's were unsuccessful. The 2007 digital imagery shows strong potential for distinguishing between areas dominated by hard bottom vegetation and those dominated by seagrass through the use of color signatures and color balancing techniques. The 2007 imagery will also provide capabilities to map dense hard bottom habitat, such as rock outcroppings, patch reefs, and shoal reefs. These habitats of the Springs Coast have received little attention by the research community, partly due to their remote and obscure locations. A preliminary review of the imagery suggests that a larger area of dense hard bottom may occur in this region than previously estimated. This paper will present examples of the imagery showing hard bottom habitats, with focus on previously undocumented shoal or linear reefs located between 8 and 12 miles offshore in Hernando County. Four areas of linear or shoal reefs were revealed in the imagery with two reaching lengths up to 3000 feet. A future mapping project is planned to map hard bottom of the Springs Coast and to complete benthic fauna assessments. This future project will establish the first geographical database of hard bottom habitat (macroalgae, sponges, octocorals, and stony coral) along the Springs Coast and will fill an existing data gap. Filling this data gap will improve the management, conservation, and protection of these vital marine habitats.

BIO-P19 Biological defense in *Passiflora incarnata*: Evidence for a chemical defense against ant defenders. N. KONSTANTINIDIS and C.C. BENNINGTON. Department of Biology, Stetson University, 421 N. Woodland Blvd, DeLand, FL 32723. Plants that are associated with ants often provide those ants with nutritious extrafloral (EF) nectar in return for protection from herbivores. In response to herbivory, increased EF nectar production can allow plants to attract even more ants, and hence increase their defense when defoliation is detected. There is a potential cost to protection via ants, however, as the reproductive success of the plant can be reduced if ants, which are typically poor pollinators, remove floral nectar. Using 41 potted *Passiflora incarnata* plants from 12 distinct genotypes grown in a shade house, we compared the change in the production of EF nectar after simulated herbivory to the change in EF nectar production in unmanipulated plants over the same time period to determine if there is an induced response to herbivory in this species. We found some evidence for an increase in the production of EF nectar after defoliation ($p = 0.08$). To ask whether *P. incarnata* flowers produce a chemical defense against ant theft of floral nectar, we tested for the presence of chemical deterrents in the floral extract. Seventeen ants from each of two species, *Camponotus floridana* and *Pseudomyrmex gracilis*, were placed into individual Petri dishes in which we spread extract from macerated floral tissue over one half of the top and bottom and distilled water over the other half. On average, ants spent less than one minute of a ten-minute trial on the side with floral extract (FE). Our results demonstrate that *P. incarnata* may become more attractive to ants when herbivory is detected and that plants also produce a chemical in floral tissues that effectively deters ant visitors from removing floral nectar. Future chemical analysis is needed to elucidate the nature of this chemical as well as its effect on other ant species that tend the EF nectaries of *P. incarnata*.

BIO-P20 Linking form and function in *Amphiprion frenatus* fish larvae. J.E. MAJORIS, J. ANTO and R.G. TURINGAN. Department of Biological Sciences, Florida Institute of Technology, 150 West University Boulevard, Melbourne, FL 32901. The ability of marine fish larvae to capture food has profound consequences for their survival and growth. The design of the feeding mechanism and the coordinated activities of cranial bones and muscles underlie feeding success in fishes. This study is designed to determine the relationship between the development of the feeding mechanism and the ontogeny of feeding selectivity in *Amphiprion frenatus*, fish larvae. Different size-sorted plankton were fed to *A. frenatus* through different developmental stages of its feeding mechanism. One to 5/6 days post-hatch (DPH) fish have less developed feeding mechanism and fed on small, non-elusive prey. In contrast, older fish (6-14 DPH) have highly developed feeding mechanism and feed on larger, more elusive prey. It is conceivable that state of development of the feeding mechanism (FORM) influences the ability of fish larvae to capture prey (FUNCTION).

BIO-P21 Feeding performance and prey selectivity of the sheepshead, *Archosargus probatocephalus*, reared on different prey types. B.B. POLOHAN-MALIAO, C.M. SCOTT and B.A. YOUNG. Department of Biological Sciences, Florida Institute of Technology, 150 W University Blvd., Melbourne, FL 32901. Adaptations to maximize foraging intake have long been recognized to be dependent on specific habitats or prey types. This study examined the effects of rearing environment on the subsequent feeding performance of the sheepshead, *Archosargus probatocephalus*, an estuarine fish species of ecological and recreational fishery importance in Florida. Young of the year *A. probatocephalus* from the Indian River Lagoon were reared under two diet regimes: one group was fed whole clam (hard prey) and the other group were fed crushed clam with meat (soft prey). Post-rearing feeding trials using whole clams revealed a consistent pattern of variation in total prey-handling time through time in fish fed hard prey. In contrast, soft-prey fed fish attacked the whole clams only during the initial trial, but completely ignored the prey during the second through the fourth trials. In addition, hard-prey fed fish ate more whole clams than soft-prey fed fish during post-rearing feeding performance trials. Results revealed that the rearing environment influences the subsequent ability of fish to process and consume available prey resources. This study contributes to our understanding of the mechanisms that underlie the success or failure of an organism in a fluctuating environment.

BIO-P22 Identifying microsatellite loci to evaluate the fitness costs of phenotypic plasticity of the andromonoecious plant *Passiflora incarnata*. M. WERNER, C.C. BENNINGTON, and A.S. SCHULTHEIS. Dept. of Biology, Stetson University, 421 N. Woodland Blvd., Unit 8264, DeLand, FL 32723. Because plants are sessile, and unable to move away from unfavorable conditions, changes in phenotype often occur in response to environmental change. For plants from temporally variable habitats, the ability to respond to the environment with a plastic alteration of morphology or physiology may provide a fitness advantage. It has also been suggested that possessing the ability to initiate a change in morphology or physiology in response to environmental stress is likely to incur a fitness cost in favorable environments. To examine the fitness costs of phenotypic plasticity among the andromonoecious plant *Passiflora incarnata*, we plan to expose the plant to an environmental stressor (herbivory) that is known to elicit a phenotypic response (*i.e.*, the production of more male flowers). Male fitness will be measured as percent of seeds sired. Seed paternity will be determined using microsatellite loci. In this study, we identified 13 potential microsatellite loci. This was accomplished by cloning microsatellite-enriched DNA into E. coli hosts. After transformation we had over 200 positive colonies. Of these colonies we have thus far sequenced 64 PCR products of the appropriate size (500-1200 bp) with an ABI 310 Genetic Analyzer. Using Seqman and MSATCommander software we have developed 13 viable primer pairs that can be used for subsequent analysis of the fitness costs to species specific phenotypic plasticity. Although tri and tetranucleotide repeat motifs were present, most were dinucleotide repeats. All primers were located at least 20 base pairs away from repeats, with 30 to 40 bps being more favorable.

CMS = COMPUTER/MATHEMATICAL SCIENCES |return to top|

CMS-01 Math anxiety in undergraduate students based on the level of mathematical classes. R. ALEMAN. Dept. of Mathematics, Saint Leo University, Saint Leo, FL 33574. Do students have the same level of math anxiety, regardless of the level of mathematics course they are taking? One of the factors being determined is whether or not students in different levels of math classes have different levels of math anxiety. The method used to determine this was to examine undergraduate math student scores on completed mathematics anxiety questionnaires. The results will be discussed in this presentation.

CMS-02 Computational problems in abstract algebra. S. BONDARI. Dept. of Mathematics and Sciences, Saint Leo University, Saint Leo, FL 33574. Group representations theory can be used to express the identities of a given algebra in term of the group ring elements. The unknown coefficients of the identities can then be computed using computer algebra. A number of open problems related to the topic are discussed.

CMS-03 A preliminary report on the relationship between mathematical preparedness and students' success in Principles of Micro and Macro Economics. B. CALDWELL and M. VO. Department of Computer and Accounting Systems and Department of Mathematics and Sciences, Saint Leo University, 33701 State Road 52, PO Box 6665, MC 2067, Saint Leo, FL 33574-6665. In this presentation we will describe the data and methodology we use to determine if there is a relationship between the mathematical preparedness of students and success in Principles of Micro and Macro Economics classes. We will employ the method of ordinary least squares to test the hypothesis that students who have are better prepared mathematically will perform better in an undergraduate economics course. The study includes the use of five

semesters of student test scores and controls for SAT math scores, whether or not a the student took a remedial math class, grade(s) in previous math class(es), gender, number of absences during the semester that the economics class was taken, and whether or not the student attended a test review. We hope to gain an understanding on whether or not mathematical preparedness has a positive effect on students' grades in Principles of Micro and Macro Economics classes.

CMS-04 Hardware accelerated computation. L. KRZEWINA. Department of Mathematics and Sciences, Saint Leo University, Saint Leo, FL 33574. Although desktop computers have become quite powerful, many scientific numerical simulations and calculations still require substantial computation time. There are several solutions available, including supercomputers and computational clusters, but these are costly and difficult to maintain. Less expensive alternatives have recently become available, such as the field programmable gate array (FPGA) and general purpose graphics processing unit (GPGPU). The relative costs and limitations of these systems are discussed. Results of digital holography calculations requiring numerous fast Fourier transforms performed on both the central processing unit (CPU) and the GeForce 8800 GT GPU are shown for an example speed comparison, proving that for an additional 20% in cost of the computer, its number-crunching prowess may be increased by at least an order of magnitude.

CMS-05 Instructor interactions are critical for increased student success in online Elementary Algebra. J.A. WHITE (1), and S.B. WHITE (2). (1) Department of Mathematics and Sciences, Saint Leo University, Saint Leo, FL 33574, (2) Department of Mathematics, St. Petersburg College, St. Petersburg, FL 33707. In this study, we compared Elementary Algebra final exam scores on a common exam for four different instructors. The course was entirely online and offered through a Catholic university. In the program, students take all of their courses online. The course shell was designed and loaded for each instructor so that assignments and tests are the same. The instructor controls the interactions in the course with choice of discussion, chat, and email options within the course. The difference between final exam scores by instructor was statistically significant for the 2006 and 2007 eight week terms. This would indicate that instructor interactions do impact student achievement on a common final exam.

CMS-06 Promoting learning of mathematics to better equip students majoring in science. J.K. WILLIAMS. Department of Mathematics & Sciences, Saint Leo University, P.O. Box 6665 Saint Leo, FL 33574. Mathematics serves as the foundation for all sciences (biology, chemistry, environmental science, physics, etc.). Despite the focal point mathematics occupies, science faculty are facing ever greater numbers of students who enter foundational courses lacking essential math skills. The use of information technologies to assist students in mastering the fundamental mathematics needed for foundational courses like general chemistry is discussed.

ENV = ENVIRONMENTAL CHEMISTRY AND CHEMICAL SCIENCES |return to top|

ENV-01 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) In search of Michael Faraday. D.F. MARTIN and B.B. MARTIN. Institute for Environmental Studies, Department of Chemistry, University of South Florida, Tampa, FL 33620. Michael Faraday (1791-1867) made notable achievements in chemistry and physics, and may have been the greatest experimental scientist of the nineteenth century. As a supplementary preparation for a course dealing with chemistry history, it was of interest to learn more about where he worked and where he was buried. He worked at the Royal Institution on Albemarle Street in London, and his laboratory is on exhibit as is his lecture auditorium (sort of), but finding his burial place was rather more challenging. Many of England's most prominent are buried in Westminster Abbey, but he is not. This presentation considers where he was buried and why he chose to be buried there.

ENV-02 Degradation of polychlorinated biphenyls through the use of an activated metallic treatment system. E.K. HOLLAND (1), M.J. GITTINGS (1), C.L. GEIGER (1), C.A. CLAUSEN (1) and J.W. QUINN (2). (1) University of Central Florida, 4000 Central Florida Blvd., Orlando, FL 32816, (2) NASA Mail Stop KT-D-2 (O&C 1133C) Kennedy Space Center Florida 32899. Polychlorinated biphenyls (PCBs) are environmentally recalcitrant compounds classified as probable carcinogens, thus structures contaminated with PCB paint continue to be an ongoing threat. The University of Central Florida, in conjunction with NASA, has demonstrated successful PCB remediation on painted weathered surfaces, including a current project located at the Badger Army Ammunitions Plant in Wisconsin. This success is due to the development of an activated metal paste treatment system. This paste system includes an activated metal and a solvent suitable for the extraction and degradation of PCBs. This is a continuation of the various approaches specifically designed for the Badger plant presented last year. The presentation will include data collected over three weeks of site remediation at the Badger

plant. PCB concentrations and degradation results from paste and paint samples collected from four Badger structures will be addressed.

ENV-03 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) Separation of aqueous boron and borates with Octolig and selected metalloligs. D. WYNN and D.F. MARTIN. IES, Department of Chemistry, University of South Florida, Tampa, Fl 33620. Trace elements in any circumstance affect any system, both positively and negatively, but boron under certain circumstances can be an especial nuisance in nuclear power plants because of the high cross section capture. The species under study are trace amounts of boron and aqueous borates. Our aim is to effectively remove these species by chromatography using commercially available immobilized ligand, Octolig® and selected metal derivatives (metalloligs). Using Cuprilig and aqueous sample of boric acid (10 ppm B), 98% of the boron was removed. But results with aqueous sodium borate (10 ppm B) and plain Octolig® were quantitatively unsuccessful. Additional results with boric acid and Octolig® will be described.

ENV-04 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) Mathematical treatment of production of TAGs by a green alga, *Chlorella vulgaris*. J.R. RODRIGUEZ, D.F. MARTIN, and T. GAUTHIER. Institute for Environmental Studies, Department of Chemistry, University of South Florida, Tampa, FL 33620. The interest in biofuels has led to a concomitant interest in the production of triacylglycerides (TAGs) from which methyl esters of long-chain fatty acids are produced for diesel fuels. A previous study by G.M Padilla (Padilla 1970) found that adding glycerol to a toxin, *Prymnesium parvum*, in natural seawater lowered the doubling time by 50%, and increased the yield of the toxin by 200% within 24 hours of adding the neutral lipids to the sample. These results along with others, (Paster et al., 1966) and (Pratt, 1940) have indicated that the first order rate constants for log-growth phase of algal growth can be used to calculate not only growth characteristics (growth constants, k, and doubling times or mean generation times, but the rates of production of significant constituents as well. Examples of the utility of the approach and prospects for current efforts will be considered.

ENV-05 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) The 140th anniversary of the first presentation of Mendeleev's periodic table. D.F. MARTIN. Department of Chemistry, University of South Florida, 4202 East Fowler Avenue, Tampa, FL 33620. March 2009 is the 140th anniversary of the presentation of Dmitri Mendeleev;s periodic table that made a major difference in the organization and understanding of chemical information. The presentation was made in Moscow by a colleague of Mendeleev's, allegedly because the author was ill with the flu. The presenter was unable to account for blanks in the table, the answer to which became a key point in the acceptable of Mendeleev's version over one by Julius Lothar Meyer. The significance and consequences of the original presentation will be considered.

ENV-06 Research topic: Removing polycyclic aromatic hydrocarbons (PAHs) from groundwater by reductive catalysis. M. ELIE, C.L. GEIGER, and C.A. CLAUSEN. University of Central Florida, 4000 Central Florida Blvd., Orlando, FL 32816. Polycyclic aromatic hydrocarbons (PAHs), often found in oil spills and in soil at petrochemical plants, are one of the first classes of compounds identified as carcinogens and are therefore on the priority lists of most countries' regulatory agencies for environmental remediation. PAHs, relatively nonbiodegradable, are produced as byproducts of fuel burning (whether fossil fuel or biomass), and as such are prevalent in the environment from both natural and anthropogenic sources. Thus, efficient technologies for removal of PAHs in contaminated sites have to be uncovered urgently. Treatment plants are now forced with the challenge of developing new techniques to remove these contaminants from effluents streams as new information on their transport and fate is released. Many advanced treatment options are available and degradation using bimetallic catalyst is a promising technology. This presentation is an experimental assessment of the application of bimetallic catalysts such as Mg/Pd, for removal of polycyclic aromatic hydrocarbons from wastewater and groundwater. This technique has been shown to be effective at degrading some other polluting compounds, such as possible carcinogenic Polybrominated biphenyl ethers (PBDEs) and Polychlorinated biphenyls (PCBs) compounds. The current limitations and future research needs associated with this treatment technology are also discussed with regard to the contaminant of interest.

ENV-07 Two parameters of the optimization of a polychlorinated biphenyl removal system. M. GITTINGS (1), E. HOLLAND (1), C. GEIGER (1), C.A. CLAUSEN (1), and J.W. QUINN (2). (1) University of Central Florida 4000 Central Florida Blvd. Orlando, Fl 32816, (2) NASA Mail Stop KT-D-2 (O&C 1133C) Kennedy Space Center, Florida 32899. Polychlorinated biphenyls, PCBs, are a group of environmental contaminants that were used in the manufacturing of paints, caulkings, inks, and pesticides for their stability and antifungal properties. In the 1970's, they were banned by the Environmental Protection Agency due to their probable human carcinogenic status. Because PCBs do not readily degrade in

the environment, they continue to be an ongoing threat. The University of Central Florida and the National Aeronautical Space Administration have developed a paste system that removes PCBs from painted surfaces. Commercialization of this product requires the optimization of the remediation system including ways to improve cost *vs*. benefit. Two parameters are considered; the optimal thickness of the paste system and the optimal volume of solvent required for maximum removal of the PCBs. Using these parameters, other properties of the paste system can be optimized, thus commercialization can occur.

ENV-08 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) A comparison of the ease of separation of sulfate, phosphate, nitrate, and nitrite from aqueous solutions using Octolig® and its metal derivatives. F.W. STULL and D.F. MARTIN. IES, Department of Chemistry, University of South Florida, Tampa, Fl 33620. One proposed method for sequestering and disposing of liquid radioactive waste is vitrification. The vitrification process, however, suffers from several problems derived from the presence of sulfate, phosphate, nitrate, and nitrite in the liquid radioactive waste. In the current study, we are determining the effectiveness of Octolig® (a commercially available immobilized ligand)at removing the four species together in an aqueous solution that is similar in concentration and proportion to that found at the Hanford site, a location containing liquid radioactive waste. A solution containing 150 ppm nitrite, 12 ppm nitrate, 135 ppm phosphate, and 30 ppm sulfate was passed through a 2-cm diameter chromatography column containing Octolig® packed to 20 cm in length at a rate of 10 mL/min. 50-mL fractions were collected until the effluent TDS concentration was constant. Then concentrations of each ion in the resulting fractions were determined. Over 99% of the phosphate and sulfate, 98% of the nitrite, and 96% of the nitrate were removed from the aqueous solution by Octolig®.

ENV-09 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) Women advisees of Alfred Werner-I. D.F. MARTIN and B.B. MARTIN. Institute for Environmental Studies, Department of Chemistry, University of South Florida, Tampa, FL 33620. Professor Alfred Werner, University of Zurich, received the Nobel Prize in 1914 for his contributions to the development of Inorganic Chemistry, specifically the field called chemistry of coordination compounds. One of his lesser known contributions was his encouragement of students from many nations as well as his encouragement of his women advisees. Only one of his students followed in the field he developed, though they continued in chemistry. Chana Weizmann had a useful career in chemistry in Israel following her graduate work, and the presentation considers her development and Werner's exceptional nature.

ENV-10 Oxidative destruction of perfluorooctane sulfonate. P. MALONEY. Department of Chemistry, University of Central Florida, 4000 Central Florida Blvd, Orlando, FL 32816. Perfluorooctane sulfonate (PFOS) was used in a myriad of industrial processes and products because of its unique chemical properties. Due to recent studies that have shown PFOS's capacity to bioaccumulate and its potential health risks to organisms, even at low concentrations, much effort has been directed to discovering a practical means of remediation. This presentation will focus on recent research that uses boron-doped diamond (BDD) film electrodes to oxidatively destroy PFOS. BDD film electrodes create very negative oxidation potentials, which allow for direct electron transfer from the PFOS molecule to the BDD electrode. Product, kinetic, and computational analyses were performed as a basis for the proposed mechanism.

ENV-11 Crystalline silicotitanates for removal of Sr and Cs from high-level radioactive liquid waste. S. NOVAES-CARD. Department of Chemistry, University of Central Florida, 4000 Central Florida Blvd, Orlando, FL 32816. Disposal of radioactive liquid waste poses a continuous problem to the nuclear energy industry. Strontium-90 and Cesium-137 are responsible for roughly 10% of the activity of high-level waste (HLW), but account for most of its toxicity and heat production. Leaky fuel elements release these highly soluble fission products into cooling water, which must then be sequestered as waste to prevent transfer of these species into biota. Ion exchange materials are currently in use in the waste treatment process, but they have poor selectivity for specific ions and are hindered by the alkaline, high-sodium conditions of HLW. Crystalline silicotitanates have been shown to be highly selective for the cesium ion due to a structural shift that takes place as it is exchanged into the lattice. The determination of this mechanism via x-ray diffraction and density functional theory modeling will be explored. This type of crystalline silicotitanate can be modified via substitution of niobium for up to 25% of the titanium molecules, which can be used to tune the material's selectivity between strontium and cesium ions.

ENV-12 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) Degradation of mono BDEs with zero-valent bimetallic systems. L. TALALAJ (1), K.M. CARVALHO-KNIGHTON (1). and R. DEVOR (2). (1) Environmental Science, University of South Florida, 140 7th Ave South DAV 258, St. Petersburg, FL 33701. (2) Department of Chemistry, University of Central Florida, 4000 Central Florida Blvd., Orlando, FL 32816-2366. Polybrominated diphenyl ethers (PBDEs) are a group of widely used brominated flame retardants. Due to their extensive use, increasing levels of

PBDEs have been found in humans, fish, birds, marine mammals, sediments, house dust, air, and supermarket foods. As a new environmental pollutant, a feasible in-situ remediation method is needed. This study focuses on remediation through the use of mechanically alloyed palladium on magnesium. Mono substituted diphenyl ethers will be observed to look at pathway selectivity.

ENV-13 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) Investigating the viability of biodiesel using kinematic viscosity, FTIR & NMR Spectroscopy. D.D. GRUENEBAUM, J.R. MOONEY, and J.K. WILLIAMS. Department of Mathematics & Sciences, Saint Leo University, P.O. Box 6665 Saint Leo, FL 33574. Is Biodiesel a viable alternative fuel? Over an eight week period, commercially purchased B99 biodiesel derived from whole virgin soybean oil and petroleum diesel samples, both with and without Stabil, were placed in sample fuel tanks for degradation under real world Florida conditions. Results were tracked by comparing kinematic viscosity, FTIR, and NMR. Degradative changes were apparent in the biodiesel, but not in the petroleum diesel. In conclusion, the stability of this highly touted alternative fuel (Biodiesel) should be very much in question.

ENV-14 UPTAQ - Understanding the Profile of Tampa Bay's Aquatic Quality Program: Bridging elementary education and university research. C. SIMMONS (1), K.M. CARVALHO-KNIGHTON (2), A.J. PYRTLE (1). (1) College of Marine Science, University of South Florida, 140 7th Avenue South, St. Petersburg, FL 33701, (2) Department of Environmental Science and Policy, University of South Florida St. Petersburg, 140 7th Avenue South, St. Petersburg, FL 33701. The University of South Florida St. Petersburg College of Arts and Science (USFSP CAS) Environmental Science, Policy & Geography Department, USF College of Marine Science (USF CMS) and USF St. Petersburg College of Education (USFSP COE) collaborated and launched UPTAQ, a new program designed towards local science teachers of 4th and 5th grades. The UPTAQ program began with a four week summer short course which included hands-on learning opportunities with environmental scientists and educators in the field as well as in the laboratory. Teachers learned first hand sampling procedures in local environments and analytical procedures conducted in a wide range of laboratories. Water quality kits, field guides, curriculum activities, GPS units as well as GPS and GIS training were provided to seven Pinellas County science teachers in order to enhance knowledge of Tampa Bay's natural resources and research conducted at this institution. Teachers were provided customized curriculum designed from the national science education digital libraries, as well as classroom field trip support and individual classroom consultations available during the 2008-2009 school year. The initial outcomes of the UPTAQ program will be discussed.

ENV Poster

ENV-P23 (***In conjunction with the Tampa Bay Section of the American Chemical Society***) Determination and presentation of water-quality trends in the Loxahatchee National Wildlife Refuge. R. MILLER. Chem-Hydro Science and Consumer Products, LLC, 5004 East Fowler Ave C316, Tampa, FL 33617-2181. The Arthur R. Marshall Loxahatchee National Wildlife Refuge (LNWR mainly WCA-1) was mentioned in the original 1988 Federal law suit against the South Florida Water Management District and the Florida Department of Environmental Protection. The suit alleged that the State had failed to enforce existing water-quality laws of Florida to protect LNWR and the Everglades National Park. To assist in restoration efforts, water-quality data from South Florida Water Management District and the U.S. Geological Survey were compiled and reviewed to assess background conditions and look for trends in concentration. The uncensored seasonal Kendall statistical test was applied to water-quality data from the LNWR for the period 1974-2004 to assess water-quality trends. This statistical test is a robust, nonparametric test that is not sensitive to outliers in data sets and requires no assumptions about the data distribution. A 95-percent confidence level ($p = 0.05$) level was used for all tests. The statistical software is called S-ESTREND by the U.S. Geological Survey and uses S-PLUS as its programming platform. The uncensored seasonal Kendall test is monotonic and can yield only linear trends for the time period selected for statistical testing. Consequently, LOESS (locally weighted scatter-plot smoothing) plots of the data were used to determine time periods for statistical testing for trends. Three seasons were used: January to May, June to September, and October to December to correspond to the late dry season, rainy season, and early dry season, respectively. Results of the trend determinations are presented graphically for easy interpretation for specific conductance, chloride ions, sulfate ions, total phosphorus, and total nitrogen. In very general terms, long-term trends were downward from about 1974 to about 2002 for these five constituents and there were a few short-term uptrends in specific conductance, chloride ions, and sulfate ions from about 1998 to about 2003. This study was done during the author's employment at the U.S. Geological Survey before his retirement in 2006.

**Abstracts of the 73rd Annual Meeting of the Florida Academy of Sciences,
in conjunction with the
Tampa Bay Section of the American Chemical Society
Saint Leo University, Saint Leo, Florida
20-21 March 2009**

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MED-01 Carbohydrate estimation on the ileal surface in *Eimeria* sp. infected partridges. E. CAMPBELL (1), S. MERRICKS (1), M. GOLDOVA (2) and A.T. MARIASSY (3). (1) Barry University, Miami Shores 33161, (2) Univ. of Vet. Med., Kosice, Slovak Republic, (3) NSU, College Of Medical Sciences, Ft. Lauderdale 33328. Pattern of Coccidial infection varies with the *Eimeria* and host species. We hypothesized that the parasite attachment and colonization of the specific intestinal segments is at least in part, based on the interaction of carbohydrates and lectins on the surfaces of parasites and intestinal epithelium. Coccidial life cycle requires self propagating re-infection of intestinal mucosa. This process eventually diminishes and becomes self limiting. To test our hypothesis, we used lectin probes to examine the carbohydrate expression of epithelial glycocalyx in the infected partriges. *E. duodenalis* (5k/animal) infected partridge chicks were examined one and six days post infection (p.i.) with biotinylated lectins listed with (abbreviations) and binding carbohydrates: *Arachis hypogea* (PNA) Î²-gal-(1->3)D-galNAc; *Dolichos biflorus* (DBA); *Bandeiraea simplicifolia* I.B4 (BSA I.) Î±-D-Gal Î±-D-galNAc; *Ulex europeus* I. (UEA), Î±-L-fuc; *Maackia amurensis* II (MAL), Î±-sialyl and *Pisum sativun* (PSA), Î±-man. Biotinylated lectins were added onto serial histological sections and binding was detected by ABC Vector Kit®. Deletion and non-biotinylated lectins were used as controls. In comparison to the ileum 1 day p.i. surface binding of PNA, DBA, UEA, MAL and GNL decreased in range of 50% ($P < 0.05$), while BSA, PSA and deletion controls did not show significantly diminished lectin binding. The results indicate a significant change of the ileal glycocalyx environment as regards to the carbohydrate expression 6 days after post infection. This finding may play a role in the acquired resistance of the Coccidia exposed birds. Further quantitative exploration of these findings is being currently undertaken. (Supported in part by a NSU Faculty Grant.)

MED-02 Morphometric assessment of the lectin reactive carbohydrates in the lung peripheral airways in *P. hemolytica* pneumonia: A comparison of stereological and computerized image analysis methods. M. ESSIET (1), A. OGÉ (1) and A.T. MARIASSY (2). (1) Barry University, Miami Shores, FL 33161, (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. The purpose of this study was to examine the small bronchioles in lung parenchyma of experimentally *P. hemolytica* infected sheep, to quantitatively determine their carbohydrate content with lectin probes. Detection of binding was made with HRP/DAB substrate. Reaction product appeared as a distinct brown deposit, well discernible on the background of the light DIC image of histological sections. The stereological assessment was made utilizing the images to count hits on reaction product with a 32 x 30 point grid, spaced 1cm apart, on 8X10 inch images rotated through 4 equal angles. The resulting quantity of hits was divided into total points on the estimated structure, end expressed as %. The identical images were also measured directly with the Image Pro Plus® computer program. Measured reaction product areas were expressed as % of the measured epithelial areas. Statistical comparison of the two measuring methods, showed no significant differences between the tested methods. Although the computerized measuring method is for a number of reasons more applicable to especially direct measurements, the stereological estimation by point counting well matches the results of direct measurement and maybe useful especially when no direct units of measurement are needed for determining the measured subject content. (Supported by NSU Faculty Research Grant.)

MED-03 Stereological assessment of tracheal mucosal carbohydrates: Pilocarpine stimulated response. Y. GONZALES (1), and A.T. MARIASSY (2). (1) Barry University, Miami Shores, FL 33161, and (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. Airway mucous secretion is an autonomically mediated defense mechanism. We hypothesized that the stimulated muscarinic receptors will respond with an alteration of mucus production. Our previous study (Am Rev Resp Dis vol 147. pp1550-1556, 1993) demonstrated both qualitative increase in total secretion and qualitative changes in the specific expression of carbohydrate moieties. The purpose of the present study was to quantitatively assess the stored AB/PAS (Alcian blue/periodic acid-Shiff reactive carbohydrates after a pilocarpine, (0.5mg/kg in 10ml saline) I.V. dose to adult ewes (four experimental) and 10 ml normal saline (four controls). After two hours the animals were killed and lung fixed with B-5 fixative. The reactive carbohydrates were stereologically estimated as the percentage of AB/PAS hits on digitized histological sections of tracheal epithelium and tracheal glands. Tracheas from pilocarpine treated sheep had a 30% decrease in AB/PAS positive storage areas (*i.e.* goblet cells) in epithelium and 25% decrease in AB/PAS positive areas in the glands when compared to controls. (43.37ï,± 9.51 SD *vs* 29.95ï,± 12.03 SD $p<0.05$) and (43.21ï,± 9.11 SD *vs*. 32.49ï,± 17.06 SD, $p<0.05$). These results confirm quantitatively the subjective observation of discharge and thus diminished mucus stored in the airways after muscarinic stimulation. This finding may have a contributory effect on secondary infections especially as observed in post-viral, bacterial infections of airway mucosa. (Supported by NSU Faculty Research Grant.)

MED-04 Comparison of alveolar macrophage populations in the lung of severe & non-severe asthmatics. R. HANNA AL-SHAIKH (1), T.N. ESPINAL (1), and A.T. MARIASSY (2). (1) Barry University, Miami Shores, FL 3316, (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. In the lung parenchyma alveolar macrophages are the first line of defense against allergens. They have phagocytic and microbicidal roles, as well as having the capability of releasing a plethora of factors, that mediate the inflammatory response and participate in the resolution of pneumonia. We hypothesize that macrophage number and activation would differ in two groups of asthmatic subjects. We present here an analysis of alveolar macrophage populations in severe (death caused by asthma) and non-severe asthmatics (death of asthmatic not caused by asthma). Random selection of lung parenchymal sections was examined and macrophages were assessed in alveoli. Macrophages were expressed as number per mm^2. In severe asthmatics (12) there was a sizable variation of macrophage numbers averaging 29.02 ±27.34 STD *vs*. 4.95 ±2.55 STD in non-severe asthmatics (6) ($p<0.05$). The quantitative estimation of macrophages confirms the qualitative impression of macrophage population in the asthmatic lungs. As lung parenchyma is damaged and debris increases with each asthmatic episode in time the macrophages increase in numbers and implicitly indicate their participation in the chronic perpetuation of this disease. The exploration of macrophage activation and suppression will yield a fertile ground for search of the asthma cure. (Supported by the NSU Faculty Research Grant.)

MED-05 Coccidial colonization of the duodenum in the *Eimeria*, *E. procera* infected partridge. S. KHOUNTHAM (1), V. LETKOVA (2) and A.T. MARIASSY (3). (1) Barry University, Miami Shores 33161, (2) Univ. of Veterinary Medicine, Kosice, Slovak Republic, (3) NSU, College Of Medical Sciences, Ft. Lauderdale 33328. Coccidial parasitism remains a significant detrimental factor in avian husbandry. Effective antihelmintics are based on the detailed knowledge of the parasite life cycles. The purpose of this study was to observe and quantify the developmental stages of the parasitic infection in partridge, a useful model for free range bird husbandry. Samples of duodenum were formalin fixed and H&E stained. Duodenum cross-sections of *E. procera* infected partridge chicks were used to quantify the distribution and abundance of developmental stages of *E. procera* parasite. Five samples of infected and observed on day one and five samples were observed on day six. The number of each developmental stage was differentially tallied. In cases of densely infected areas, estimations were made from a single microscopic field at 40x objective, multiplied and assigned incremental ranges of >30, >40, >50, >75, >100, and > 150 for each stage. The results of our quantitative observations show coccidial colonization of the duodenum proceeds in a progressively intensifying fashion; however the process is uneven with regards to distribution of subsequent stages of the developing parasites. Merozoites ranged from 0 to 46.4 ±33.4 STD, microgamet pods were rare and macrogamets ranged from 0 to 17.4 ±10.1 STD. These results can be used to further understand the dynamics of re-infection process and apply this information to the understanding of the mechanism of Coccidiosis infection. (Supported by NSU Faculty Research Grant.)

MED-06 RAGE: A common therapeutic target for Alzheimer's disease, cancer, and diabetes. S.W. VETTER and E. LECLERC. Department of Chemistry and Biochemistry, Florida Atlantic University, 777 Glades Road, Boca Raton FL 33431. RAGE (Receptor for Advanced Glycation Endproducts) is an emerging new target for Alzheimer's disease, diabetes, and cancer. Animal studies have clearly demonstrated that targeting RAGE in these diseases is therapeutically useful. Clinical trials with RAGE as a therapeutic target have begun recently. Despite its clinical relevance, the understanding of RAGE on the molecular level is still very incomplete. Defining individual RAGE-ligand interactions on the molecular level is important to understand how RAGE contributes to disease development and progression on the cellular level. RAGE is a cell surface receptor of the immunoglobulin family with three extracellular domains, a single transmembrane helix and a short cytoplasmic tail. RAGE is a multi-ligand receptor and as such is capable of binding multiple unrelated ligands. All RAGE ligands are proteins and generally associated with cell damage in some way. Advanced glycation endproducts (AGE) are formed by non-enzymatic glycation of proteins under conditions of hyperglycemia or at sites of increased glucose metabolism. AGEs also form during food processing and a role of RAGE activation by dietary AGE in intestinal inflammation and cancer has been proposed. RAGE also interacts with amyloids formed from various proteins or peptides. In Alzheimer's disease RAGE contributes to transport of Î²-amyloid across the blood brain barrier and mediates Î²-amyloid toxicity in neurons. The third large group of RAGE ligands are the calcium binding S100 proteins. These proteins function as damage and danger associated signals when released in the extracellular space. RAGE is the major receptor for S100 proteins. We are interested in defining on the molecular level the interaction of RAGE with S100 proteins.

MED-07 Effect of pilocarpine on carbohydrate stored in the sheep bronchial epithelium: Stereological assessment and comparison of two methods. M. LAM (1), D. NUNEZ (1), and A.T. MARIASSY (2). (1) Barry University, Miami Shores 33161, (2) NSU, College of Medical Sciences, Ft. Lauderdale 33328. Attachment of microorganisms to the airway

surface is based on the interaction of carbohydrates and lectins on the microorganisms and on airways cells and secretions. To simulate an increased secretory activity as is known to be present during a response to inhaled iritants and microrganisms, we used pilocarpine, as a secretagogue and quantitated the carbohydrates detected with lectin probes: BSA, GNL, LCA, MAL, PNA and PSA. Lectin localization was detected by Avidin-Biotin, Vector Kit.® Two stereological assessment were used: point counting and sigmoidal line intercept methods. Point counting method showed that BSA, GNL, MAL and PNA reactive areas increased in pilocarpine treated sheep ($P<0.05$) while bronchial secretory cells containing LCA, PSA did not show significant changes. The sigmoidal intercept method of assessment did not indicate the differences in the carbohydrates comparisons when pilocarpine treated sheep were compared to controls with those of point count and previously made direct measurements of reaction product. The discrepancy in the results may stem from a smaller number of hits resulting from the assessment by sigmoidal intercept method. We conclude that these findings should be considered when deciding on the tools for quantitative estimations of specific, defined areas of the differential expression of carbohydrates. (Supported by NSU Faculty Research Grant.)

MED-08 Differential epithelial cell counts of bronchial mucosa in severe asthmatics. N.L. LAMB (1), M.M. GEORGE (1), and A.T. MARIASSY (2). (1) Barry University, Miami Shores, FL 33161, (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. Chronic severe asthma is a result of long term remodeling of the airways. One of the metaplasial changes includes mucosal surface modification. Recurrent inflammatory episodes in severe asthma attacks modify the epithelial cell populations. We wished to detect these changes with differential counts of ciliated, goblet, non-ciliated secretory, basal, inflammatory and undeterminable cells in histological H&E stained microscopic slides. Under a compound microscope, we viewed 19 slides of airways from subjects who had died of chronic asthma. The asthmatics had numerous areas of basement membrane denudation, either partial or complete, exposing the remarkably thickened basement membrane. These areas were excluded from our counts. The counts were made by the first 2 authors and the results are remarkably similar in comparing the percentage of the assessed cell populations. The differential counts of asthmatics *vs*. control, respiratory disease free subjects were: 36% ± 13 STD *vs*. 53% ± 20 STD ciliated cells, 7% ± 11 STD *vs*. 9 ± 13 STD goblet cells, 15% ± 8 STD *vs*. 13% ± 11STD secretory cells, 37% ± 6 STD *vs*. 23% ± 3 STD basal cells, 8% ± 5 STD *vs*. 3% ± 8 STD inflammatory cells, and other cells (cells that were unidentifiable), 1% ± 1 STD. The resulting data indicate metaplasia towards secretory, basal and inflammatory cells. The observations also highlight the considerable variation of cell proportions as indicated by the large STD especially in the respiratory disease free subjects. (Supported by NSU Faculty Research Grant.)

MED-09 Expression of the duodenal carbohydrates in piglets treated with probiotics. R. NEMCOVA (1), A. BOMBA (1), L.B. DRIBIN (2) and A.T. MARIASSY (2). (1)University of Vet. Med., Kosice, Slovak Republic, (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL, 33328. Epithelial expression of surface glycoproteins and stored carbohydrates is altered in response to wide array of agents. Many carbohydrate residues are known to be receptors for attachment of microorganisms. Specific probiotic are known to interfere with colonization of the gut by pathogenic microflora. We examined the lectin detectable expression of carbohydrates in the duodenum of probiotic, *Lactobacilus casei*, (*Lcb. casei*) treated (three), and control (three) weaned piglets. Fixed and paraffin embedded duodenal sections were reacted with 7 lectins and localized carbohydrates detected with Vector ABC kit®(CA). The lectin-binding patterns of the duodenal mucosa were scored from 0 to +4. Epithelial glycocalyx ranged from 0 to +4, epithelial goblet cells from 0 to +3, were stained only with BSA, UEA and GNL, occasional epithelial cell from 0 to +3 bound BSA, MAL and GNL lectins. Mucous cell in the duodenal glands, bound BSA, UEA and GNL lectins, while only some serous cells were stained with UEA. The lectin binding of the probiotic treated piglet duodenum generally increased in intensity, glycocalyx decreased and goblet cells increased in reactivity. Taken together, the results suggests an alteration of the carbohydrate environment of the duodenum which adversely effects the expression of carbohydrate receptors, thus preventing the attachment of pathogenic microflora. (Supported by NSU Faculty Research Grant.)

MED-10 Mast cell abundance in *P. hemolytica* pneumonia in sheep. S.P. PATEL (1), J.M. JEONG (1) and A.T. MARIASSY (2). (1) Barry University, Miami Shores, FL 33161, (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. Normal sheep lung contains an unusually numerous population of mast cells. Acute inflammation, involves a participation theses cells. We hypothesize that their degranulation and exhaustion will reflect on the mast cell population in an acute experimental, bacterial pneumonia. We present here an assessment of the mast cell abundance as detected with lectin molecular probes in infected and control sheep lung parenchyma. Lung sections were reacted with biotinylated lectin, *Dolichos biflorus* (DBA) that binds to Î±-D-galNAc and detected with the ABC Kit (Vector, CA). Binding of lectin was visualized with di-aminobenzidine, a brown insoluble precipitate on the mast cell granules. Controls included lectin

detection and carbohydrate pre-incubation. In comparison to controls, the infected sheep lungs had a lower number of lectin detectable granule containing mast cells when compared to controls (6.10±3.40 *vs*. 14.50±4.28, $p<0.05$) per10X field. The parenchyma of *P. hemolytica* infected lung in contrast to decrease in mast cell exhibited a marked increase in neutrophil numbers. Mast cells participate in the initial response to infection and become depleted in the acute phase of the lung response to bacterial infection. (Supported by NSU Faculty Research Grant.)

MED-11 Ultra-fine dust exposure causes bronchial cell population remodeling in the rat airways. V.I. PEREZ (1), R. MILLER (1), M.V. FANUCCHI (2) and A.T. MARIASSY (3). (1) Barry University, Miami Shores, FL 33161, (2) SPH, University of Alabama, Birmingham, AL 35294, (3) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. Environmental pollution causes remodeling of airways and their cell populations. We hypothesized that an acute exposure suckling rat pups would cause a shift in epithelial cell population decreasing the goblet cells, reflecting the extrusion of mucus onto the airway surface in response to inhalation of particulates. We examined the effect of ultra-fine dust exposure of eight day rats (two controls, five experimental) on the airway cell populations (exposure protocol and the models justification in Anat. Histol.Embryol.30: 345-349, 2001.) After six hour exposures and two hour recuperation the pups were processed for morphologic diagnosis. Bronchial cross sections of glycol embedded and methylene blue stained sections were used for differential assessment of the epithelial cell populations; ciliated, non-ciliated, basal, goblet, and inflammatory cells. The dust exposed rats showed 20% decrease ($p<0.05$) of goblet cells, 60 % and a 25% increase ($p<0.05$) of ciliated cells, when compared to controls. Small inflammatory foci were found in both groups. The results confirm the data, where airway cell population differential counts in acute protocols of exposure to irritants cause changes towards the depletion of secreting cells and increase of other cells in the epithelium. This shift reflects the airways response to irritation by secretions for surface protection. The mechanism of the goblet cell signaling and consequent replenishment and the pathways to this end remain to be further explored. (Supported by the NSU Faculty Research Grant.)

MED-12 Computerized estimation of stored mucus in antigen challenged sheep tracheal tissues. S. SANCHEZ (1), S. JARRETT (1) and A.T. MARIASSY (2). (1) Barry University, Miami Shores, FL 33161, (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. Airway surfaces are exposed to the streaming antigens in the inhaled air. Mucosa of the airway has to respond to this environment in a number of ways, one of which is elaboration of secretions that protect the airway surface. We compared the abundance and distribution of epithelial secretory cells detected with Alcian blue /periodic acid Shiff reagent (AB/PAS) with Image-Pro Plus® on digitized images of tracheal epithelium of 4 exposed and 4 control sheep. The AB/PAS positive carbohydrate was expressed as % of the measured epithelial area. (protocol and exposure details in Journal of Allergy and Clinical Immunology. 93(3):585-593.1993). The allergen challenged sheep had an higher (28% ±5.34 STD) reactivity of AB/PAS when compared to controls (8% ±3.43 STD, ($p<0.05$). The increased volume of carbohydrates in the stored mucus in the epithelial cells (goblet) is thought to reflect the increased stimulus for mucus synthesis and storage to be delivered at a more drastic irritant. The antigen induced changes may be implicated in the altered pathogen attachment and susceptibility of membranes through carbohydrate ligands in airway epithelium and glycocalyx. (Supported by NSU Faculty Research Grant.)

MED-13 Metaplasia of the adult rat airway cell population in response to ultra-fine dust exposure. M.O. WISHNIA (1), H.A. RAUF (1) and A.T. MARIASSY (2). (1) Barry University, Miami Shores, FL 33161, (2) NSU, College of Medical Sciences, Ft. Lauderdale, FL 33328. Air pollution is known to adversely affect the respiratory system. We hypothesized that an acute exposure of adult rats (exposure and 4 controls) would cause a shift in epithelial cell population in response to inhaled particulates. We analyzed the amount of ciliated, non-ciliated, basal, goblet and inflammatory cells in airways of rats. Exposure protocol and the models justification were published in Anatomy Histology Embryology 30: 345-349, 2001. Bronchial cross sections were stained with methylene blue and photographed. Differential cell counts were made of ciliated, non-ciliated, basal, goblet, and inflammatory cells. There was a dramatic decrease of cell size, essentially doubling the number of cells per photographic frame. Exposed rats showed 22% decrease ($P<0.05$) in goblet and 62% decrease ($p<0.05$) of the non-ciliated secretory cells when compared to controls. There was a 2-fold increase of inflammatory cells, while basal cells were unchanged as compared to controls. The results confirm the generally accepted paradigm where airway cell population differential counts in acute exposure to irritants show a depletion of secreting cells and increase of other cells in the epithelium. This shift reflects the airways response to irritation by secretions for surface protection. The mechanism of the goblet cell signaling and consequent replenishment and the pathways to this end remain to be further explored. (Supported by the NSU Faculty Research Grant.)

MED-14 Markers for incipient Paget cells in extramammary Paget's disease. A.A. SMITH. School of Podiatric Medicine, Barry University, Miami Shores, FL 33161. Epithelial membrane antigen (EMA or MUC1) and carcinoembryonic antigen (CEA) are useful markers for the Paget cells of extramammary Paget's disease (EMPD) or primary Paget's carcinoma). Some apparently normal keratinocytes show a positive reaction for EMA or CEA or both. These are probably incipient Paget cells (or pre-Paget cells). If so, EMPD arises from keratinocytes rather than from Toker cells. The fact that incipient Paget cells outnumber mitotic figures in Paget cells suggests the possibility of a multifocal origin for EMPD.

MED Posters

MED-P24 Changes in size and distribution of muscle fiber types of the extensor digitorum longus and soleus muscles in rats following reinnervation after sciatic nerve crush. S. ACKBARALI and S. SESODIA. School of Podiatric Medicine, Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. Numerous studies have demonstrated that denervation of skeletal muscle causes atrophy and changes in other molecular components of muscle fibers, *e.g*. myosin heavy chain (MHC) isoforms and metabolic enzymes. However, reinnervation promotes restoration of some of the changed parameters such as muscle fiber size, MHC isoform expression and myosin ATPase reactivity. The purpose of this study is to determine the changes in size and distribution of muscle fiber types following reinnervation of a fast and slow-twitch muscle. Female Wistar rats (Charles River Laboratories) were anesthetized by an intraperitoneal injection of ketamine (90 mg/kg) and a subcutaneous injection of xylazine (20 mg/kg). An incision was made posterior to the femur, just distal to the sciatic notch, and the underlying layers of tissue were blunt dissected to expose the sciatic nerve. A pair of flat No. 5 forceps (Hamilton Bell) was used to crush the sciatic nerve for 20 seconds. The cut ends of tissue layers were apposed and the wound was closed with 6-0 nylon sutures. After 21 days, each rat was euthanized with ketamine (180 mg/kg) and xylazine (20 mg/kg) along with cervical dislocation. The extensor digitorum longus (EDL) and soleus (SOL) muscles were collected from each rat and frozen in cold 2-methyl butane (isopentane). Blocks from the belly of each muscle were cut and stored in a -70°C freezer. Sections (10Î¼m) were cut from the blocks for immunohistochemical staining for slow and fast MHC isoforms and staining for myosin ATPase. The results of this experiment will be further described and discussed.

MED-P25 Broad spectrum antimicrobial activity of GermBullet™. H.E. LAUBACH (1), S.H. GHANAVATI (2) and G. WHIDDEN (3). (1) College of Medical Sciences, Nova Southeastern University, Ft. Lauderdale, FL 33328, (2) Inhalable Solutions™, LLC, NE 5th Avenue A102, Boca Raton, FL 33431, (3) Natures Symphony, 48 NE First Avenue, Boca Raton, FL 33432. Two types of GermBullet™ essential oil blends were tested against bacterial strains of *Pseudomonas aeruginosa* ATCC 9027, *Serratia marscens* ATCC13880, *Staphylococcus aureus* ATCC 6538 and *Staphylococcus warneri* ATCC 17917 and against the fungi, *Candida albicans* ATCC 10231, *Aspergillus fumigatus* ATCC 10894 and *Fusarium solani* ATCC 36031 to determine the spectrum of in vitro antimicrobial activity using aromatograms (disc diffusion assays). Plate cultures of bacteria and *C. albicans* were grown for two days and plate cultures of the molds for seven days, harvested in normal saline to a concentration of 106 cells per ml, plated on nutrient and Sabouraud's agar plates, respectively, and dried. Sterile 6-mm discs were dipped into each of the undiluted GermBullet™ and GermBullet™14 blends, dried and placed into the center of each of the inoculated agar dishes. A disc containing normal saline was used as a control. Following a 24-hr incubation of bacteria and *C. albicans* at 37°C and a 72-hr incubation of the molds at 23°C, the zone of inhibition for each blend was recorded in mm (including the disc). Plates were done in triplicate and an average ± 1 SD was recorded. The greatest antibacterial activity was exhibited with *P. aeruginosa* and *S. marscescens* followed by *S. aureus* and S. warneri. A high level of activity was associated with C. albicans, a lower level with *F. solani*, and still lower activity with *A. fumigatus*. Microbes were affected by both GermBullet™ and GermBullet™14 multi-purpose blends in a similar manner. The saline control disc was negative for antimicrobial activity while the two blends exhibited significant zones of inhibition for all for bacteria and for the three fungi. Future studies on the effect of GermBullet™ on the antimicrobial flora of the human respiratory tract will be necessary to determine the health benefits acquired from inhaling the blend in a convenient nasal inhaler.

MED-P26 Destaining mucins in histological sections. A.A. SMITH (1) and I. GLICKFIELD (2). (1) Barry University, Miami Shores, FL 33161, (2) Brandeis University, Waltham, MA 02453. Mucicarmine and mucihematein can be removed with acid alcohol. Zirconyl hematoxylin can be removed with Sinha's fixative. PAS can be removed with hydrogen peroxide. Alcian blue can be removed with 5% trifluoroacetic acid in dichloroethane. Colloidal iron can be bleached in 10% household bleach in alcohol. With a few exceptions, bleached sections can be restained with mucihematein, PAS, or Gabe's trichrome.

**Abstracts of the 73rd Annual Meeting of the Florida Academy of Sciences,
in conjunction with the
Tampa Bay Section of the American Chemical Society
Saint Leo University, Saint Leo, Florida
20-21 March 2009**

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PSS-01 Gas Electron Multiplier development for muon tracking. T. GARLICK, N. LEIOATTS, A.Q. SEGOVIA, A. MENENDEZ, B. STORCH and M. HOHLMANN. Dept. of Phys. and Space Sciences, Florida Institute of Technology, 150 W. University Blvd, Melbourne, FL 32901. A Gas Electron Multiplier (GEM) records ionizing particles (in this case, radiation from cosmic rays) in a two dimensional plane with great spatial precision, which is ideal for muon tomography. Our detector employs 3 independent GEM foils for amplification. Ar/CO_2 gas flows through the detector and is ionized by radiation, a process which is tested with a known 55 Fe source. The major benefit of this detector is that the readout is independent of the amplification process, allowing for multiple types of readouts to be used, which is where our current focus has been. Readout electronics have been problematic, with a large signal-to-noise ratio. One cause of this was found to be capacitance in the readout. This motivated us to produce a smaller readout strip attached directly to the amplifier chip and to move the electronics directly into the gas box.

PSS-02 Performance comparison of the triple-gas electron multiplier (GEM) and the drift tube muon detectors used for muon tomography. K. GNANVO, R. HOCH, M. HOHLMANN, J. LOCKE, D. MITRA. Florida Institute of Technology, Physics and Space Sciences Department, 150 West University Boulevard, Melbourne, FL 32901. Muon tomography is the interpolation of the densities and positions of matter through which a muon has passed based on the beginning and ending positions and momenta of that muon. Using computer simulations, we analyze the possible performances of two types of muon detectors: triple-GEM and drift tube. The physical test conditions (the detector, target, and environment) are created using the Geant4 computer program, and the natural flux of muons is simulated using the CRY computer program. Rudimentary trucks with uranium and other dense materials on board are placed inside the detectors. The images of the truck produced by both types of detectors are compared for their precisions and resolutions. Each type of detector is further analyzed by running a simulation without any targets inside the detectors. These simulations model the densities of muon activity within the detectors, showing the most sensitive places therein.

PSS-03 The GTC 10.4 m telescope: Getting ready for first light. R. GUZMAN. Department of Astronomy. Bryant Space Science Center, University of Florida, PO Box 112055 Gainesville, FL, 32611-2055. The Gran Telescopio Canarias (GTC) is the largest optical and infrared observatory in the world. It has been built in the Canary Islands by an international consortium of astronomical institutions, including the University of Florida. Scientific operations with the GTC will start in March 2009. We will describe at this meeting the technical capabilities of this state-of-the-art observatory and the scientific impact it will have in various areas of astronomical research within the state of Florida.

PSS-04 Advances in reconstruction algorithms for muon tomography. R. HOCH, M. HOHLMANN, and D. MITRA. Department of Physics and Space Sciences, Florida Institute of Technology, 150 W. Univ. Blvd., Melbourne, FL 32901. Cosmic ray muons continually bombard the earth at a rate of about 1 muon /cm^2/minute. Muons are mainly influenced by the Coulomb force while passing through matter. As the muons pass the nuclei of atoms this force causes the path of the muons to alter. The amount of scattering a muon experiences is generally a function of the atomic number of the material it's passing through. A non-intrusive inspection can be done on a cargo volume by using specialized detectors to measure precisely where a muon entered and exited the volume. Reconstruction algorithms can use this and other relevant information to determine the atomic number of the materials in the volume. The Point of Closest Approach (POCA) algorithm is a primitive reconstruction algorithm that estimates where a muon scattered. A maximum-likelihood method can also be used that is based on a statistical model of cosmic ray muons that accounts for multiple scattering. We will show how these algorithms work and were implemented at FIT. We will also show some of the results run on data obtained from Geant 4 Monte Carlo Simulations.

PSS-05 Studying stellar nurseries with FLAMINGOS (FLoridA Multi-object Imaging Near-IR Grism Observational Spectrometer). E. LADA, R. ELSTON, B. FERREIRA, C. GOMEZ-MARTIN, N. GORLOVA, J. LEVINE, N. MARINAS, N. RAINES, and C. ROMAN-ZUNIGA. Department of Astronomy, University of Florida, 211 Bryant Space Science Center, PO Box 112055, Gainesville, FL 32611-2055. The FLAMINGOS infrared imager and multi-object spectrograph is the first instrument of its kind in the world and was built at the University of Florida Astronomy Department. It allows us to penetrate deep into dense molecular clouds, where stars (and planets) are being born. The uniqueness of the instrument is that it allows us to take spectra of about two dozen objects at once, enabling investigations of young clusters of stars in a short time period. We have been conducting a survey of the main star-forming regions in the Galaxy with

FLAMINGOS at the National Optical Observatory's telescopes on Kitt Peak in Arizona. Here we present results for several clusters of young stars For the first time we determine ages of these embedded populations, that range from a few hundred thousand years to about 5 Million years. We also identify a few substellar objects (brown dwarfs) with protoplanetary disks.These results provide important constraints on the the life-time of the molecular cloud and on the protoplanetary disk evolution.

PSS-06 Exploring the birth place of planets: A mid-infrared imaging survey of young stars. N. MARINAS (1), C.M. TELESCO (1), R.S. FISHER (2), and C.C. PACKHAM (1). (1) Astronomy Department, University of Florida, Gainesville, FL 32611, (2) Gemini Observatory Northern Operations Center, Hilo, Hawaii 96720. The study of disks of gas and dust surrounding very young stars is critical to understand the formation of solar systems. These disks provide the material needed for the formation of planets. To study the dust component in these disks and their stage of evolution, we used the 8-meter Gemini North and Gemini South telescopes in the infrared to image the circumstellar environments of 20 nearby (less than 1000 light years) young stars known to have circumstellar dust. Disks of warm dust with radius tens to hundreds of AU were present in 50 % of the stars studied. On average, smaller dust particles spread out in large warm disks produce the mid-infrared emission in less evolved systems, while larger dust particles concentrated in small regions near the stars dominate the emission in the more evolved systems. The apparent growth of dust particles sizes found in this work indicates that the formation of planetary systems is underway around these young stars. None of the more massive stars included in this survey had large warm disks, implying that disks around more massive stars evolve faster than in their lower mass counterparts. (Project funded in part by NASA GSRP program and NSF SEAGEP program.)

PSS-07 QuarkNet and cosmic ray muon flux experiments. A. MENENDEZ, M. ABERCROMBIE, and M. HOHLMANN. Department of Physics and Space Sciences, Florida Institute of Technology, 150 W. University Blvd., Melbourne, Florida 32901. QuarkNet is a nation-wide outreach program run by Fermilab National Laboratory to help high-school teachers introduce their students to the world of high-energy particle physics. Teachers, students, and physicists collaborate to inform students about the science and technology behind detecting cosmic ray muons as well using that data for studies. Here we present how the QuarkNet detectors work as well as several interesting experiments measuring the flux from different detector orientations that we ran on our college campus, the studies we conducted, and some of the results that followed from them. We use scintillator paddles, photomultiplier tubes, a DAQ card, and a computer to detect and capture the data from the cosmic ray muon strikes.

PSS-08 Mid-infrared spectroscopic observations of Cygnus A. M. MERLO (1), E. PERLMAN (1), C. PACKHAM (2), R. MASON (3), N. LEVENSON (4), J. RADOMSKI (5), I. ARETXAGA (6), and M. IMANISHI (7). (1) Dept. of Physics and Space Sciences, Florida Inst. of Tech., Melbourne, FL 32901, (2) Astronomy Dept., Univ. of Florida, Gainesville, FL 32611-2055, (3) Gemini North Observatory, Hilo, HI 96720, (4) Dept. of Physics and Astronomy, Univ. of Kentucky, Lexington, KY 40506, (5) Gemini South Observatory, La Serena, Chile, (6) INADE, Aptdo Postal 51 y 216, 72000 Puebla, Pue., Mexico, (7) National Astronomical Observatory, Mitaka, Tokyo 181-8588, Japan. According to the unified model of active galactic nuclei (AGN), the central engine is surrounded by optically thick clouds in a toroidal structure. Most of the energy from the central engine is absorbed by the torus, and re-emitted in the mid-infrared. Since the composition and geometry of the torus is still ill-defined, mid-IR data, especially spectroscopic data, provides valuable insight into this region. We present mid-IR spectroscopic observations of the radio-loud AGN Cygnus A using the Subaru 8.2m telescope and the COMICS instrument. For our observations, the COMICS instrument was set to a slit width of 0.3'' and a spectral resolution of 250. This is the first powerful radio galaxy to have 8m class resolution ground-based mid-IR spectroscopic and imaging observations, providing a new window into the inner working of a radio-loud AGN. While the orbital environment gives Spitzer superior sensitivity, ground-based telescopes can achieve diffraction-limited observations in the mid-IR, allowing spatial resolution approaching 0.3". We present an analysis of the spectroscopic features found in Cyg A, along with a comparison of our spectra with mid-IR spectra obtained for the Spitzer Space Telescope. These observations will set the stage for future mid-IR observations of radio galaxies and complement and guide our ongoing survey of nearby radio galaxies in the mid-IR.

PSS-09 Accretion disks and tidal torques of the Moon on the Earth. M.M. MONTGOMERY. Univ. of Central Florida, 4000 Central Florida Blvd., Dept. of Physics, MAP 305A, Orlando, FL 32816. We review the analytical theory of the tidal torque by the Moon on the Earth and thus Earth's retrograde precession due to this primary influence. From this classical mechanics theory, we generate retrograde precessional theory in accretion disks. By taking appropriate assumptions, we arrive, through different means, to the retrograde precessional results obtained or assumed by others such as

Katz et al. (1982) for a thin ring; Warner (1995) for a tilted disk's outer annulus; Larwood et al. (1996) for protoplanetary disks; Romero et al. (2000) for quasars and black holes; Terquem et al. (1999) for protostellar disks; and others. We test our version of our dynamical term to the retrograde precession of accretion disks by comparison with observational results obtained from non-magnetic Cataclysmic Variable systems. This work is from Montgomery (2004) and is submitted to ApJ (2009). (Project supported in part by the UCF/UF Space Research Initiative and by an AAS/NASA Small Research Grant.)

PSS-10 XMM-Newton observations of S5 0716+71. J. RANDALL. Department of Physics and Space Sciences, Florida Institute of Technology, 150 West University Boulevard, Melbourne, FL 32901. Spectral and temporal analyses were performed on XMM-Newton data of S5 0716+71, a strongly variable BL Lacertae. Light curves and spectra were analyzed to look for evidence of spectral variability in the object and as a comparison to previous research on this object. Light curves were analyzed in the total, soft, medium, and hard energy bands, and divided into eight intervals, each interval of which was fit to a power law, broken power law, log parabolic law, double power law, power law plus black body component, and power law plus bremsstrahlung component. The power law spectral fit shows that a second component is needed to obtain good fitting in the upper energy range, confirming the presence of both synchrotron and IC emissions. The broken power law and log parabolic fits yield the best fit. Data shows both synchrotron and Inverse Compton emission, though very little correlation was seen between the emission strength and the spectral slope. The fact that the hard x-ray spectral indices appear slightly softer and greater than 2, suggests that the synchrotron component varies but that the slope of the component does not change. It also suggests that the location of the break was moving through the hard x-ray band. Other low energy BL Lac objects are also being analyzed at this time in an effort to reanalyze all XMM-Newton and Chandra data of low energy BL Lacs, similar to the efforts of Perlman et al. (2005) for high energy BL Lacs.

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PSS-P27 Final implementation of a High Performance Computing Cluster at Florida Tech. P. FORD, X. FAVE, K. GNANVO, R. HOCH, M. HOHLMANN, and D. MITRA. Department of Physics and Space Sciences, Florida Institute of Technology, 150 W. University Blvd., Melbourne, FL 32901. The HPC cluster at Florida Tech is two years into development and has met several milestones that effectively finalize its construction and implementation. The system has been upgraded to the latest versions of the Rocks OS and the Condor batch-job manager. In addition to software upgrades, the cluster has been integrated into the Open Science Grid Production grid and has become an official USCMS Tier-3 compute element, processing 125,000 hours of CMS data to-date. We have also allowed several faculty members to use our resources alongside our own Muon Tomography simulations. The hardware has also been upgraded with top-of-the-line machines and a total of 160 available CPUs. We will detail the final design and performance of the cluster, as well as the core configuration of the system. The concept of Tier-3 sites and our participation in the CMS project will be outlined.

PSS-P28 RR Lyrae variables in two fields near M32. A. SARAJEDINI and C.L. MANCONE. Department of Astronomy, University of Florida, 211 Bryant Space Science Center, Gainesville, FL 32611-2055. We present Hubble Space Telescope observations taken with the Advanced Camera for Surveys Wide Field Channel of two fields near M32 - between four and six kiloparsecs from the center of M31. The data cover a time baseline sufficient for the identification and characterization of 681 RR Lyrae variables of which 555 are ab-type and 126 are c-type. The mean magnitude of these stars is $\langle V \rangle = 25.29 \pm 0.05$ where the uncertainty combines both the random and systematic errors. The location of the stars in the Bailey Diagram and the ratio of c-type RR Lyraes to all types are both closer to RR Lyraes in Oosterhoff type I globular clusters in the Milky Way as compared with Oosterhoff II clusters. When the periods and amplitudes of the ab-type RR Lyraes in our sample are interpreted in terms of metallicity, we find the metallicity distribution function to be indistinguishable from a Gaussian with a peak at $\langle [Fe/H] \rangle = -1.50 \pm 0.02$, where the quoted uncertainty is the standard error of the mean. Using a relation between RR Lyrae luminosity and metallicity along with a reddening of $E(B-V) = 0.08 \pm 0.03$, we find a distance modulus of $(m-M)o = 24.46 \pm 0.11$ for M31. We examine the radial metallicity gradient in the environs of M31 using published values for the bulge and halo of M31 as well as the abundances of its dwarf spheroidal companions and globular clusters. In this context, we conclude that the RR Lyraes in our two fields are more likely to be halo objects rather than associated with the bulge or disk of M31, in spite of the fact that they are located at 4-6 kpc in projected distance from the center.

PSS-P29 Mixed apparatus radio-wave investigation of atmospheric cosmic-rays of high ionization (MARIACHI). R. SOTO (1), C. VIANNA (2), and H. TAKAI (3). (1) Tallahassee Community College, Tallahassee, Florida 32304, (2) UFRJ, Rio de Janeiro, Brazil 21941-972, (3) Brookhaven National Laboratory, Upton, New York, 11973. Project MARIACHI

(Mixed Apparatus Radio-wave Investigation of Atmospheric Cosmic-rays of High Ionization) is an ongoing research that includes the collaboration of Brookhaven National Laboratory, Long Island high schools, and universities that include Stony Brook University and Suffolk County Community College. We seek to validate radar detection as an inexpensive tool to detect Ultra High Energy Cosmic Rays (E > 1020 eV) over an area of 2,500 km^2, and to search for new techniques for the detection of Ultra High Energy Cosmic Rays (UHECRs). The detection of UHECRs has commonly been accomplished by detection of the particles from air showers, ground arrays, or by way of detection of the light produced by ionization in the atmosphere from Cherenkov radiation. MARIACHI is an innovative concept that will explore the detection of UHECRs by bi-static radar using VHF transmitters. This method will inexpensively and efficiently enable scientists to explore the physics of cosmic rays, their correlation with atmospheric phenomena, cloud formations, and lightning triggers, as well as methods of probing the higher atmospheres and postulating questions that include where they are coming from and what kind of source is roducing these cosmic rays. Using PVC pipe, coaxial connector, coaxial cable, a farad magnet, and two aluminum cylindrical rods 1.07m long, we constructed a dipole antenna that will be used to detect UHECRs at a frequency of 67.26MHz. Upon completion of constructing the antenna, we used a frequency analyzer to measure the Standard Wave Ratio (SWR) of the antenna to discover a value of 1.2. From the SWR value, the antenna is efficient for use at the Brookhaven National Laboratory. This antenna is currently being used to detect meteors by feeding a coaxial cable from the antenna to a PCR-1000 receiver that demodulates the signal. A personal computer is connected to the receiver via sound card and uses Spectrum Lab software to collect data of High Energy events in the atmosphere at a radius of 2,500 km^2. This antenna will be installed at Florida A&M University Research Facility in Tallahassee, Florida to continue the gathering of data in a different area of the atmosphere. These data will then be compared to that collected at Brookhaven National Laboratory to determine any atmospheric correlation.

PSS-P30 *Spitzer* IRAC detection and analysis of shocked molecular hydrogen emission. J.E. YBARRA and E.A. LADA. Department of Astronomy, University of Florida, 211 Bryant Space Science Center, PO Box 112055, Gainesville, FL 32611-2055. We use statistical equilibrium equations to investigate the IRAC color space of shocked molecular hydrogen. The location of shocked H_2 in [3.6]–[4.5] *vs*. [4.5]–[5.8] color is determined by the gas temperature and density of neutral atomic hydrogen. We find that high excitation H_2 emission falls in a unique location in the color-color diagram and can unambiguously be distinguished from stellar sources. In addition to searching for outflows, we show that the IRAC data can be used to map the thermal structure of the shocked gas. We analyze archival *Spitzer* data of Herbig-Haro object HH 54 and create a temperature map, which is consistent with spectroscopically determined temperatures. This work is based in part on archival data obtained with the Spitzer Space Telescope, which is operated by the Jet Propulsion Laboratory, California Institute of Technology under a contract with NASA. (Support for this work was provided by an award issued by JPL/Caltech and also a NASA LTSA Grant NNG05GD66G.)

TCH = SCIENCE TEACHING |return to top|

TCH-01 The use of familiar samples in the analytical chemistry curriculum. R. INDRALINGAM and J.M. BEUSSE. Department of Chemistry, Stetson University, 421 N. Woodland Blvd. Unit 8271, DeLand, FL 32723. Instructors usually assign “unknowns” to students in the instrumental analysis class, for sample preparation and analysis by instrumental techniques, in order to quantitatively determine the concentration of an analyte. We have found that students are more motivated and eager to carry out these laboratory experiments when the samples consist of familiar culinary items such as eggs, or over-the-counter pharmacy formulations. We have developed a new laboratory experiment in which students determine the concentration of the active ingredient in a nasal spray using synchronous scan fluorometry coupled with the standard addition method. We will present the experimental details of the laboratory method and typical results obtained by students.

TCH-02 Incorporating first source reading and media elements in a science survey course. L.E. ONDROVIC and T. ARNOLD. Saint Leo University Math and Science Department University Campus - MC2188 PO Box 6665 Saint Leo, Fl 33574-6665. Within a three-semester hour course students are exposed to the major scientific disciplines and discoveries in a broad context. To engage the students in understanding the role of scientists as authors and savants, students study relevant readings and media. The first source readings were chosen based upon their influential impact when originally published, and/or based on the stature of the author as scientist. Media (two videos) were chosen to compare and contrast the first source reading material, or promote an open discussion of the future of science and humanity. The books chosen were: "Silent Spring" (Rachel Carson), "The Dragons of Eden" (Carl Sagan) and "A Brief History of Time" (Stephen Hawking). Following the reading and discussion of Silent Spring, students watched the recently produced video "An Inconvenient

Truth" (Al Gore). Students were asked to compare and contrast "An Inconvenient Truth" with "Silent Spring", in message, content and presentation, then engaged in a spirited intellectual debate of the subject integrating science, morality, social justice, and politics. As we moved on to the next book we kept up a schedule of study of the sciences from a text book managing about two chapters per week. Following at three week intervals we read and discussed "The Dragons of Eden" and the subsequent discovery of specialized brain regions. Each student led a discussion of a chapter from the book and wrote a reflection on the book. To introduce the students to physical sciences authors, the class read A Brief History of Time. While most (but not all) of the students were able to comprehend its abstractness, it stimulated a lively discussion about the writer's style, contrasting it to Sagan and Carson. Lastly, to promote extrapolation of the possibilities of science, the class viewed the video "GATTACA". The class then wrote an essay on the scientific accuracy, symbolism, parallels to epoch mythology and overall message(s). In one sixteen week semester it is manageable to include multiple reading and media sources to illuminate science. By incorporating active and collaborative experiences in the classroom involving writings, presentations and discussions, evaluation at multiple levels is afforded.

SOC = SOCIAL SCIENCES |return to top|

SOC-01 Alexithymia and dimensions of dissociation in adults with a childhood history of physical or sexual abuse. Y. CASTILLO, J. MORROW, S.N. GOLD. Center for Psychological Studies, Nova Southeastern University, 3301 College Avenue, Davie, FL 33314. Alexithymia is a cognitive-affective deficit that involves difficulty identifying and expressing emotions, and a thinking style based on external, rather than internal, experiences. Research has confirmed a link between alexithymia and dissociation in individuals with a history of psychological trauma. However, few studies have assessed this relationship in survivors of physical or sexual abuse. Participants in the present study were 88 adult survivors of physical or sexual abuse, who were seeking treatment at a private South Florida university clinic. They were predominantly female (81.8%), with mean age of 38.72 years (SD = 10.27), ranging from 21-63 years. Clients completed the Toronto Alexithymia Scale (TAS-20) and the Dissociative Experiences Scale (DES). A series of ANOVAs revealed that alexithymia was significantly related to amnestic dissociation ($F [1, 89] = 14.91$, $p = .001$), depersonalization ($F [1, 89] = 25.87$, $p = .001$), and absorption ($F [1, 89] = 22.42$, $p = .001$). Clients with alexithymia received mean scores of 16.58 on amnestic dissociation, 38.10 on absorption, and 21.13 on depersonalization. The scores of clients without alexithymia were 5.90, 19.52, and 4.74 respectively. Findings confirm the link between alexithymia and different dimensions of dissociation. Implications for research and clinical practice are discussed.

SOC-02 The examination of oppression through the eyes of Haitian American and African American male college students. D.M. JACKMAN (1), P.D. HALL (1), and G.E. IBANEZ (2). (1) Department of Psychology, Barry University, 11300 NE 2nd Ave, Box. PSY, Miami Shores, FL, 33161, (2) Center for Drug and Alcohol Studies, University of Delaware, 2121, Ponce de Leon Blvd. Coral Gables, FL 33134. Oppression is an issue still facing ethnic minority groups in the United States (Watts, 2001). The present study analyzes the meaning of oppression in Miami as seen by Haitian American and African American male college students (n = 20). Males were chosen for this study because research has shown them to be more sensitive to their environment (Watts, 2002). There has been limited research on Haitian Americans and they, along with African Americans are susceptible to being oppressed and further discriminated against. The photo voice methodology was used in this study. The participants took pictures that would address three research questions. The questions were as follows: "*What do you consider oppression to be in the community of Miami?*", "*How can you reduce oppression in this area?*", and, "*How can the community leaders reduce oppression in this area?*". After the pictures were taken, the researchers held audio-taped meetings with the participants. The participants explained how the pictures corresponded to the questions they answered. The data from the audiotapes will be qualitatively analyzed in order to develop recurrent and emergent themes. Once these themes are developed, the Haitian and African American males' themes will be compared to determine if they view oppression similarly or differently. Further, the pictures taken by the Haitian and African American males will be compared to determine how these two groups choose to represent oppression visually. The study is in its final stages of data collection. (Supported by Minority Access to Research Careers Grant, T34 GM08021-25, Barry University.)

SOC-03 Religiosity, perceived benefits, and personality as predictors of volunteerism. T. LAU and P.R. DRAVES. Department of Psychology, Saint Leo University, PO Box 6665, Saint Leo, FL 33574. Volunteerism, service learning, and community service experiences are an important part of any well-rounded liberal arts undergraduate experience. There is a wide variance in the opinions about and resistance to mandated service experiences among undergraduates. Understanding student perceptions about volunteer work, as well as the types of students who are more likely to benefit from it, may help administrators to get a richer picture of volunteerism as a dynamic process. As an initial step, this cross-sectional study

examines the relationships between several self-reported psychological variables in a paper-and-pencil survey format. Specifically, the researchers are examining the relationships between demographic variables, self-esteem, religious behaviors and background, perceived benefits of volunteerism, the Big Five personality traits, and both formal and informal volunteerism. Data have been collected, and will have been analyzed well in advance of the conference. Direct effects of neuroticism, extroversion, conscientiousness, and religiosity will be tested. Researchers expect, however, a significant interaction between religiosity and authenticity (people high on both are expected to volunteer the most, followed by people high on one or the other; people low on both are expected to volunteer the least).

SOC-04 Israel's February election and its impact on Obama's Middle East Policy. J. McTAGUE. Dept. of History, Saint Leo University, MC2127, Box 6665, Saint Leo, FL 33574. President Barack Obama has served notice that the Israeli-Palestinian problem will be a high priority for his administration by quickly appointing former senator George Mitchell as his special representative for that crisis. But the recent election in Israel, in which right-of-center parties, which generally do not favor compromise with the Palestinians, gained a majority in the parliament (Knesset), will make Mitchell's task considerably more difficult. As of this writing, it is difficult to predict whether the center party Kadima's Tzipi Livni or the conservative Likud Party's Benjamin Netanyahu will become prime minister, but whichever one emerges on top, Israeli politics have swung to the right, which is not what the Obama administration desired. This paper will explore the complex multiparty politics that require governing coalitions of three, four and sometimes more parties, oftentimes with very different political agendas.

SOC-05 Relationships among CO_2 emissions and national wealth: Prospects for international climate treaty agreements. J.R. MONTAGUE. Department of Biology, College of Arts and Sciences, Barry University, 11300 NE 2nd Ave, Miami Shores, FL 33161. Data for national CO_2 emissions (million metric tons per year) and gross domestic product (annual GDP in $) collected for years 1998 and 2004 (N = 201 nations) show a strong statistical correlation between CO_2 emissions and national wealth, *i.e.*, the bigger the economy, the greater the annual CO_2 emissions. International climate treaties designed to reduce national CO_2 emissions to 1990 levels (*e.g.*, Kyoto Protocol) ought to take this fundamental relationship into account. The data show that recent history has not been encouraging for the prospects of actual reductions in global CO_2 emission rates within the next decade. Indeed, China, now the world's leading CO_2 emitter, is rapidly becoming the world's largest economy, but with no sign of meaningful reductions in CO_2 emission rates. Yet China is currently exempt from Kyoto Treaty sanctions for non-compliance. Such trends bode ill for the prospects of fair and equitable climate treaty obligations. (Partially supported by Barry EPA-RISEE Award X-83164401-0.)

SOC-06 The role of municipalities in conservation of beach-nesting birds. A.A. ORMSBY and E.A. FORYS. Eckerd College Environmental Studies, 4200 54th Ave. S., St. Petersburg, FL 33711. Beach-nesting birds in Florida, including American oystercatchers, black skimmers, least terns, snowy plovers and Wilson's plovers, have declined due to habitat loss, increases in predators, and human activities. The goals of this multi-year research project included: assessing the knowledge and attitudes of beach users in Pinellas County, Florida, toward beach-nesting birds; evaluating municipal government beach management practices; and addressing beach user perceptions of beach-nesting birds through a multi-faceted education campaign. While portions of Florida's coastline are protected and managed for preservation of biodiversity, many beaches are under the jurisdiction of county and municipal governments and are primarily managed for human recreation. Modifying municipal beach management practices may help to increase the number of suitable nesting locations and thereby the number of individuals of species of beach-nesting birds. In the summer of 2007, 400 interviews were conducted with beach users at five Pinellas County beaches, using a semi-structured survey guide, prior to the implementation of an educational campaign. A post-survey with 400 beach users was conducted in the summer of 2008. Results indicate that beach users, whether local residents or not, support beaches as a place for birds to nest. Municipal representatives were supportive of th e conservation program and took steps to assist with the education campaign. (Project funded by the Florida Fish and Wildlife Conservation Commission.)

SOC-07 Predictors of suicidal ideation among college students. B.N. SCAGLIONE. Saint Leo University, FL 33574. The purpose of this study is to identify which is the better moderator of suicidal ideation among college students: a student's resiliency or reasons for living. The participants were 104 participants from a small catholic college in Florida volunteered to participate in the confidential survey study. Survey packets containing a consent form, demographic questionnaire, the ASAP-20, DASS-21, SRI-25, DSRS and the BRFLI were distributed to participants. A linear regression was conducted to identify which moderator was a better predictor of suicidal ideations: internal protective, emotional stability, external protective, fear of disapproval, moral objections, survival coping beliefs, responsibility to family, fear of

suicide, depression, anxiety, stress, and the depression self rating scale. Then a hierarchical linear regression was performed, once the two predictors were identified. The hypothesis is that subjects who score high on both the Suicide Resiliency Inventory (SRI-25) and Brief Reasons for Living Inventory (BRFLI) will score lower on the Adolescent Suicide Assessment Protocol (ASAP-21). Results supporting this hypothesis suggest that both resiliency and reasons for living play a key role in the occurrence and intensity of suicidal ideations among the college student population. Results of the multi-linear regression revealed that the emotional stability subscale of the SRI-25 (0.497) and the depression subscale of the DASS-21 (0.308) were significant predictors of suicidal ideations among college students. The results of the Hierarchical Linear Regression, although there was an increase in R^2, the increment was not statistically significant (R^2 increment = 0.096, $p < .01$), indicating that the combination of emotional stability and suicidal ideations are not significant moderators.

SOC-08 Authenticity, conservativism, and social desirability: Examining their relationships. C.Y. VALERIO and P.R. DRAVES. Department of Psychology, Saint Leo University, MC 2127, PO Box 6665, Saint Leo FL 33574. The authors are conducting a study of the relationships between personality traits, demographics, and socially desirability as a response tendency. Social desirability can be viewed as both a potentially contaminating response bias and as a personality trait related to political correctness that encourages said response bias. Previous literature has established a consistent relationship between social desirability and certain personality traits (*e.g*., authoritarian personality). The authors are examining its relationship with other personality variables(authenticity, worldview, and conservativism) and certain demographic variables (age, gender, race, and socioeconomic status), as well as its appropriateness as a proxy variable for political correctness. Discussion during presentation will focus not only upon the study being conducted, but also upon social desirability as both a potential contaminant and a variable of substantive interest in and of itself. Participants will be undergraduate students at a small, private university. Researchers will present data analytic results as well as a brief theoretical explanation from a social-personality psychology point of view.

SOC-09 The motivation of college students. C. WILLIAMS. Department of Psychology, Saint Leo University 33701 State Road 52 Saint Leo, Florida 33574. Previous research clearly demonstrates that teachers have a positive influence on student motivation. Research has also verified that enthusiasm is necessary for students to succeed. The purpose of the current study was to compare college students and their motivation to stay in school and to succeed. This study aimed to determine if there was a significant difference among the level of motivation among the seniors, juniors, sophomores, and freshmen. The researcher assessed the desire of the participants to achieve good grades by use of a survey, which examined their study strategies and exam performance as well as achievement motivation. The results for the tested hypothesis were not significant. The researcher found a correlation between the study strategies and exam performance and achievement motivation scales. The results from this study show that it is important to examine achievement motivation and to develop ways to improve student engagement in the classroom.

SOC Posters

SOC-P31 HIV treatment adherence in minority women: The role of intimate partner violence and beliefs about medication. J. AUGUSTE, L. FERRER-WREDER (1), and D.L. JONES (2). (1).Dept. of Psychology, Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161, (2).Dept. of Psychiatry and Behavioral Sciences, University of Miami 1400 N.W. 10th Avenue, Miami, FL 33136. A literature review was conducted to examine the role of intimate partner violence and medication concerns on HIV/AIDS adherence. Studies have shown that women's beliefs about medication negatively impact their ability to remain consistent with prescribed medication for chronic illnesses (Sankar, Luborsky, Schuman, and Roberts, 2002). Additionally, studies have also demonstrated that women who are victims of intimate partner violence and infected with HIV are likely to delay treatment and have difficulty taking their medication consistently (Lichtenstein, 2006). Adherence is an important health care problem and a better understanding of the factors that affect adherence can enhance the quality of health care.

SOC-P32 The role of personality and coping styles in the perception of work-family conflict. A. BABALOLA, G. WATED, and L. SZUCHMAN. Department of Psychology, Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. Work-family conflict (WFC) is defined as a situation where the demands of work and family roles are mutually incompatible and exceed the resources available for an individual to manage them. There is empirical evidence suggesting that WFC is a major problem area in our society. In fact, there is evidence suggesting that WFC increases the likelihood of experiencing psychological distress and developing psychiatric disorders such as mood, anxiety, depression, substance dependence, and substance abuse. The purpose of the present study was to critically analyze, summarize and compare prior

research relevant to the role that personality traits and styles of coping play on the perception of anticipated work-family conflict. Previous studies have shown that individuals who score high on neuroticism also tend to perceive more conflict both at work and at home than less neurotic individuals. On the other hand, there is evidence suggesting that individuals who score high on extraversion, agreeableness, conscientiousness, and openness to experience tend to perceive less WFC than individuals who are less extraverted, agreeable, conscientious, and open to experience. Research also suggests that certain styles of coping, such as direct-action coping, positive thinking, and help-seeking coping are effective in reducing work-family conflict. However, the majority of these studies mainly focused on working adults and the way they perceive WFC. Currently, there are only a few studies that have examined how younger people, particularly college students, expect to perceive WFC as well as the variables that influence those perceptions. Future research could explore potential relationships between personality traits such as neuroticism and conscientiousness as well particular coping styles and work-family conflict in this population. Proposed relationships among these variables in undergraduate college students are presented.

SOC-P33 Parental attitudes toward immunization of children with autism. M. BALGOBIN and L. BACHELLER. Department of Psychology, Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. This is a literature review looking at parents' attitudes towards vaccination and autism. Autism rates have significantly increased over the past two decades in the United States. According to Tribune Information Services (2008) 20,000 children were diagnosed with autism spectrum disorder in 1980 and the numbers have alarmingly risen to 125,000 in 2003. The exact cause for autism is unknown. However, in 1998 Dr. Andrew Wakefield suggested that the MMR vaccine may be linked to autism in children (Evans, Stoddart, Condon et al, 2007). It is speculated that thimerosal, a mercury-based preservative used in the measles-mumps-rubella (MMR) vaccine and other vaccinations may be a factor in the cause of autism in children. Although mercury is no longer found in childhood vaccines in the United States, some parents still have concerns about vaccinations (National Institute of Mental Health, 2007). The proposed study aims to examine whether the perception of the link between vaccination and autism was a factor in parents' decision in whether or not to vaccinate their children. Also, to find out whether parents perception of immunization and its possible link to autism in children varies with regards to ethnicity, parental education, socioeconomic status and availability of health care. A web-based survey will be constructed and administered to both parents whose children have been diagnosed with autism and parents who have children who have not been diagnosed with autism. Parents' responses to immunization and autism may provide valuable information as to whether they believe that vaccines cause autism and whether there is need for education in order to reduce the fears that parents may have concerning vaccination. (Supported by Minority Access to Research Careers Grant, T34 GM08021-25, Barry University.)

SOC-P34 Beliefs associated with attrition among college students. J.A. CANTT and G. WATED. Department of Psychology, Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. Salient behavioral, normative, and control beliefs associated with college attrition are the antecedents to the prevailing adopted attitude, subjective norm, and perceived behavioral control that in combination can lead to a student's intention to drop-out from college (Ajzen, 1991). Behavioral beliefs or the beliefs associated with the desirability and likelihood of every outcome and the value placed on each outcome determine the attitude adopted towards a particular behavior. Normative beliefs are determined by perceived social pressure from the individual's family, peers, and other referent individuals, and the individual's motivation to comply with their expectations results in a prevailing subjective norm. Control beliefs are the perceived factors that can either inhibit or facilitate the performance of a given behavior depending on the belief strength and power that determine the perceived behavioral control. The purpose of the present study was to conduct a literature review in order to identify the salient behavioral, normative and control beliefs among college students relevant to attrition from college. A content analysis of the literature revealed 17 behavioral beliefs, six normative beliefs, and eight control beliefs associated with attrition among college students.

SOC-P35 Body dissatisfaction among Asian and Western Cultures. M. CHUNG and S. KONCSOL. Department of Psychology, Barry University, 11300 NE 2nd Avenue, Miami Shores, Fl 33161. In modern society, being thin is a mark of attractiveness. Women and men go to great lengths to achieve the thin ideal body image, not just in the United States but such body ideals are prevalent in other countries, such as South Korea, as well. However, research regarding body dissatisfaction among the Korean population is sparse, so research was redirected to cultures similar to Korea. Comparisons between the Western culture and Asian culture reveal that both populations have some degree of body dissatisfaction. Research among adolescents showed that when adolescents turn 13 years old they form attitudes about body dissatisfaction. Research also shows that regardless of body weight status (normal *vs*. obese), adolescents with higher levels of body weight and body shape concerns had lower self-esteem and higher levels of body dissatisfaction and depression. Studies examining

body dissatisfaction in relation to social pressure among Chinese adolescents showed that social pressure did effect levels of body dissatisfaction. Research among American adults found that body dissatisfaction existed among both men and women but in varying levels. This literature review examines the different research about body dissatisfaction among cultures.

SOC-P36 The influence of images and messages of rap music: How is it affecting the brains of America's youth? S. CLELAND and P.D. HALL. Department of Psychology, Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. Until 1987, no empirical studies were done on the effects of rap music on children and adolescents. Yet, the Parent Music Research Center (1985) and Tipper Gore (wife of former U.S. Vice-President) both called for a ban on heavy metal and rap music. This controversial proposed ban led to a discussion as to whether or not these bans were warranted. The results to date are mixed. Hall (1998) showed that children under 10 years of age were not able to perform explicit memory tasks after listening to rap music but could perform implicit memory tasks. The children were asked to listen to rap songs and then state what the songs were about or state if they recognized the lyrics from amongst the lyrics to songs they did not listen to. They were able to do the latter task (recognition task) but not the former task (recall task). These findings suggest that younger children are not sure what they are listening to. Furthermore, it is not clear whether it is the music lyrics or visual images that are affecting children and adolescents. This has yet to be explored. A literature review will be conducted to determine the following: (a) what impact does rap music have on children and adolescent attitudes, behaviors, and memory, as well as (b) are there differential physiological responses made when individuals listen to rap lyrics versus when the look at visual images while simultaneously listening to rap music. A summary of findings in both areas will be done and implications for future research will be suggested.

SOC-P37 How later problem-solving and social interaction are related to earlier upbringing: a literature review. S.P. DESIR and K.H. LAURENCE. Department of Psychology, Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. In America, we are facing a critical situation where many of us report significant decreases in the number of confidants we have in our lives (i.e., Lynn Smith-Lovin et al., 2006). At the same time, record numbers of people are reporting personal and professional problems that they are not able to solve (*e.g.*, Brammer, 1990). These two factors are present in college populations, which is the focus of this literature review. Specifically, the authors pose the question whether there is evidence that supports a link between early upbringing and later social interaction and problem solving skills in college-aged individuals. Additionally, age, ethnicity and other patterns found in the literature will be discussed.

SOC-P38 Acceptance of the menstrual cycle as a function of culture, femininity, and perception of body image. S.S. FRANCIS, S.W. KONCSOL, and L. BACHELLER. Department of Psychology, Barry University, 11300 N.E. Second Avenue, Miami Shores, FL 33161. The menstrual cycle has historically been viewed with negative connotations from silent trepidation to outright denigration. This stigma of uncleanliness, though somewhat softened, still exists today. The purpose of this poster is to review the research related to cultural differences in acceptance of the menstrual cycle, also incorporating issues of femininity and perception of body image. Studies have demonstrated that feelings toward the menstrual cycle vary across culture. These emotions range from happiness, to fear, or no emotion. Menstruation is a physical function capable of being performed only by a woman's body. Studies have shown that the media presents conflicting messages about menstruation: it is depicted as a normal event but one which is a hygienic predicament that should be kept secret and well hidden. Studies have shown that at the onset of menarche there is the attempt to reconcile changes in body image with the developing gender role identity. Body image is to an extent developed as a function of the culture's definition of what characterizes feminine and masculine bodily appearance. As menarche is partly viewed as responsible for the physical and physiological changes leading to puberty, ultimately the menstrual cycle may be viewed negatively if these changes are not satisfactory. Implications for future research lie in examining the messages women have been given about their bodies, and budding sexuality from a cultural standpoint, and consequently how these have shaped their acceptance of the menstrual cycle.

SOC-P39 Religious belief and psychological well-being. J. GONZALEZ and F. MUSCARELLA. Department of Psychology, Barry University, 11300 N.E. Second Avenue, Miami Shores, FL 33161. There is contradictory research regarding the relationship between religious belief and psychological well-being. The purpose of this poster is to review and critique the research in this area. A number of studies have shown that people with strong religious beliefs have less anxiety and depression than people with weaker religious beliefs. It is theorized that there are several factors which contribute to the positive effects of religious belief on psychological well-being. It is speculated that the factors associated with this are a sense of meaning in one's life and ritualistic and communal behaviors. Conversely, a number of studies have shown a negative relationship between religious belief and psychological well-being. For example, in some cases people with strong

religious beliefs were found to have greater depression and anxiety than people with weaker beliefs. It is speculated that this may be due to maladaptive coping mechanisms generated by religious belief. Finally, some studies have shown no relationship between religious belief and psychological well-being. There appear to be several factors that contribute to the contradictory findings. These include variation in methodology, variation in the samples of participants, and a lack of identification of the specific elements of religious belief that affect psychological well-being. Recommendations are made to improve the research in this area. (Supported by Minority Access to Research Careers Grant, T34 GM08021-25, Barry University.)

SOC-P40 Childhood sexual abuse: sexual functioning and sexual self-schemas. N. HIVE, F. MUSCARELLA and S.W. KONCSOL. Department of Psychology, Barry University, 11300, N.E. Second Avenue, Miami Shores, Fl 33161. The purpose of this poster is to review the literature on the relationship between childhood sexual abuse, sexual functioning and sexual self-schemas in women. A large body of research shows that childhood sexual abuse is common and can result in impaired sexual functioning. However, there is variation in these findings with some studies reporting either little or no impairment in sexual functioning. It has been speculated that sexual self-schemas maybe the mediating variable. Anderson and Cyranowski (1994) present a sexual self-schema model where there are four different types. The type of sexual self-schemas may determine the level of sexual functioning in spite of childhood sexual abuse. It is suggested that negative schema types are more closely associated with higher levels of impaired sexual functioning and positive schema types are closely associated with lower levels of impaired sexual functioning. Suggestions for studies to test this model will be discussed.

SOC-P41 Attitudes toward credit card debt among college students. B. KENNEDY, G. WATED, and L. SZUCHMAN. Department of Psychology, Barry University, 11300 NE 2nd Avenue, Miami Shores, FL 33161. The literature review presented here examines the role of attitudes toward debt in the amount of credit card debt college students accumulate before graduating. In the USA, the average outstanding balance on undergraduate credit cards is $2,169, which translates to a debt-to-income ratio of 0.24. An alarming figure considering that the average American family (including mortgages and installment loans) has a debt to income ratio of 0.12. Among the attitudinal factors that have been found to influence debt among college students are parental financial habits, unrealistic optimism, level of financial knowledge, and tolerance of debt. In addition, some researchers contend that the greater problem of "economic socialization" has lead to positive changes in terms of attitudes toward debt in countries such as the U.S. and the U.K. Although many attitudinal factors have been found to influence credit card debt, there is divergence in the literature regarding the role that these factors play in the accumulation of credit card debt. As a result, there is currently no attitudinal factor that has been found to consistently influence credit card debt in this population.

SOC-P42 Exploring associations among fear, self efficacy and anxiety in gymnasts. K. LAGO and K. LAURENCE. Department of Psychology, Barry University, 11300 NE 2nd Avenue, Miami Shores, Florida 33161. There have been numerous studies that address the benefits of participation in physical training (*e.g*, Barnett, 1998) and typically these studies show support for the association between physical training and well-being. Studies have also shown support for the benefits of training in gymnastics; however, there have been fewer of these studies conducted (Cartoni, Minganti, Zelli, 2005). Of interest to this researcher is the less-studied condition that arises when events do not go well for gymnasts (Lally & Kerr, 2008). Specifically, this poster presentation will review literature that focused on the associations among fear of injury, competitive anxiety, self-efficacy (a situation-specific self-confidence that reflects an individual's belief in his or her ability to successfully perform a skill to a certain level or degree), and state-trait anxiety in a group of female gymnasts. (Supported by Minority Access to Research Careers Grant, T34 GM08021-25, Barry University.)

SOC-P43 Racial identity, dating preferences and behaviors, and views about the Afrocentric worldview among individuals of African descent. M.A. OCEN, L. FERRER-WREDER, and K. LAGO. Department of Psychology, Barry University, 11300 NE 2nd Avenue, Miami, FL 33138. A literature review was conducted to examine research on racial identity, dating preferences and behaviors, and beliefs about an Afrocentric worldview among people of African descent. Racial identity among African Americans has emerged in contemporary research as an important and worthwhile field of study. It has been defined as the significance and qualitative meaning that individuals attribute to their membership within the Black racial group and within their self-concept. Racial identity is an area of an individual's development that is influenced by and influences a multitude of factors. It has been found to influence school performance, friend selection, self-esteem, and mood. The Afrocentric worldview has its foundation based on the historical, cultural, and philosophical traditions of African people. It encompasses several principles: Spirituality, harmony, collective responsibility, sensitivity to

emotions, concurrent time orientation, community orientation, balance, and authenticity. Individuals who endorse this worldview incorporate these principles in their daily living and in their interpersonal relationships. Although researchers have explored in depth the development of racial identity, the effects of its development on friendship, psychological well being, and many other areas, little is known about the effects of racial identity on the dating behavior, preferences, and practices of people of African descent. Even less research incorporates the relationship between African Americans racial identity and the Afrocentric worldview on dating and familial behaviors. From this literature review I learned the value of developing a unique sense of cultural identity for minority individuals.

SOC-P44 Differences in odor preferences based on gender and sexual orientation. L.A. ORTIZ, F. MUSCARELLA, and S.W. KONCSOL. Department of Psychology, Barry University, 11300 N. E. Second Avenue, Miami Shores, FL 33161. Human sexual preferences and sexual attraction to body odors appear to vary as a function of gender and sexual orientation. The purpose of this poster is to review the research related to sex differences in odor preferences based on speculated brain differentiation associated with gender and sexual orientation. Studies have shown that the organizing effects of sex hormones are responsible for human sexual preferences and sexual attraction, which are manifested in sexual and mating-related behaviors. Studies related to brain differentiation have supported that men and women have different approaches to mating selection and behaviors. Because of the sex differences seen in the human body and brain, the ability to discriminate natural body odors appears to be linked to mate preference. A number of studies have shown evidence of differences between heterosexual and homosexual men and women on various aspects of olfactory preferences. These differences in olfaction seem to be directly associated with a variety of human social and sexual behaviors. Implications for future research about the role of olfactory cues in human sexual behavior will be discussed.

SOC-P45 Children's acceptance of parents who disclose a homosexual identity. J.A. PUCKETT, F. MUSCARELLA, and L. BACHELLER. Department of Psychology, Barry University, 11300 N.E. Second Avenue, Miami Shores, FL 33161. There are a growing number of homosexual parents caring for children conceived through previous heterosexual relationships. The purpose of this poster is to review the research in the area of parental disclosure of a homosexual identity. It has been shown that parents and children have healthier development when parents disclose their homosexuality than when it is kept a secret. This being so, it is important to identify variables that may predict children's acceptance of homosexual parents who disclose their identities. Some research has been conducted in this area, but it has mainly utilized qualitative methodologies. Past studies have measured the influence of variables including the quality of the parent-child relationship, stereotypes, the heterosexual parent's reaction, sex of the parent, sex of the child, age of the child, peer influences, and parental desire for secrecy. Certain variables have been found to be associated with higher levels of acceptance (*e.g.*, daughters are more accepting than sons) while others have been associated with lower levels of acceptance (*e.g.*, fathers are less accepted than mothers). Recommendations are made to improve research in this area and prospective variables to be examined in the future are discussed.

SOC-P46 Wild ginseng: Wonder of the world. M.M. SNOW and R.K. SNOW. Applied Aviation Sciences, Embry-Riddle Aeronautical University, 600 S. Clyde Morris Blvd, Daytona Beach, FL 32114. Among the first geographers to comment on ginseng, translated as "*wonder of the world*," was *Ibn Khordadbeh* of Arabia who in the ninth century wrote of the herb in his *Book of Roads and Provinces*. Stories of the many uses of ginseng spread to the Americas as trade routes were established between the colonies and the rest of the world. Reports indicate that American ginseng was abundant before the arrival of the Europeans. However, since the settlement of North America, the species of ginseng indigenous to the continent, *Panax quinquefolius*, has become increasingly rare due to overharvesting and poor harvesting practices. As a result of high demand and the failure of harvesters to conserve, the federal government has placed *P. quinquefolius* on the list of plants that may be in danger of extinction. Thirty-one states prohibit the harvest of wild ginseng and among those states where it is still gathered, all ginseng must have certification papers before it can be shipped abroad. This research examines the rich history of ginseng, which is a mainstay of Chinese society, including its medicinal and mythical properties. Following the lead of other ecological restorationists, the goal of this longitudinal study is the reintroduction a depleted species to its native habitat. The present body of knowledge concerning the optimal growing conditions of ginseng should be enhanced as a result and could serve as a model for an economic alternative to logging deciduous forests.

SOC-P47 What is causing the changing climate for gay youth? N. TIGHE, F. MUSCARELLA, and L. SZUCHMAN. Psychology Department, Barry University, 11300 NE Second Avenue, Miami Shores, Fl. 33161. Gay youth has been identified as a troubled population, characterized by depression, drug use, and seclusion. Over the years, this perception has changed and they are now a highly accepted population, characterized by their strength and resiliency.

College is now the most accepting environment for sexual minorities. What has caused contemporary youth to be so supportive of their gay and lesbian peers? There are two theories to explain this shift in attitudes. The first is contact theory. The college environment and youth-directed media provide young people both direct and indirect contact with gay, lesbian, and bisexual individuals. This mass exposure could be eliminating stereotypes and creating positive attitudes. Another theory to explain this change is the innate bisexuality theory. A theory in evolutionary psychology holds that all people have the capacity for bisexuality under certain conditions. During college, individuals become more open-minded and liberal, experimenting more. This may be causing a greater awareness in youth of their innate capacity for same-sex attraction. This awareness may be causing empathy toward gay and lesbian peers and thus increased positive attitudes.

SOC-P48 Muscle dysmorphia in men: A cross-cultural comparison across African Americans, Hispanics, and White non-Hispanics. C. VALENCIA, S. KONCSOL, and L. SZUCHMAN. Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. Eating disorders in men are rarely seen. Men are more likely to present with body dysmorphic disorders, one of them being muscle dysmorphia (*i.e.*, dissatisfaction with body musculature). A literature review was conducted on research over the past ten years examining the presentation of muscle dysmorphia in males from three ethnic backgrounds: African American, Hispanic, and White Non-Hispanic. Concepts of machismo, acculturation, and the Western ideal male figure have been used to explain the hyper-muscularity drive in men leading to body dysmorphic disorders.

SOC-P49 Age differences in sexual attitudes and behaviors. M.M. ZUMSTEIN and T. SCAGLIONE. Department of Psychology, Saint Leo University, 33701 State Road 52, Saint Leo, Fl 33574. Since there is a prevalence of sexually transmitted diseases (STDs) and sexually transmitted infections (STI's) in the world, both sexual research and education are important. Previous research has indicated that the majority of college students do no use condoms even when partaking in risky sexual behaviors. There has been little research conducted on age and how it relates to sexual attitudes and behaviors. Sex research is important because it can be used to educate people. Knowledge about STDs and STIs may increase the necessary precautions people might take against contraction of such diseases. In the present study, researchers examined whether age, relationship status, or past sexual history played a role in sexual attitudes and behaviors. Additional relationships examined by the researcher were the relationship between age and relationship status and the relationship between relationship status and past sexual history. Participants were given an informed consent, debriefing statement, and a survey which included a brief demographic questionnaire, love and relationship biography, Sociosexual Orientation, Brief Sexual Attitudes Scale, Valois Sexual Attitude Scale, Sexual Attitudes Questionnaire, and Sexuality Scale. The participants were college students from 18-44 years old. All participants were recruited from Saint Leo University. The preliminary analysis indicated that relationship status and past experiences can play a large role in the sexual attitudes an individual may have. Age was originally thought to play an important role in sexual attitudes and behaviors, but age was not directly a significant factor in the present study.

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