Celebration *of* Scholarship & Creativity

April 15, 2015

WORCESTER STATE UNIVERSITY

Updated June 19, 2015

SCHEDULE OF EVENTS
April 15, 2015

POSTER SESSION

3:00-6:00 p.m.
Student and Faculty Presentations
May Street Building, Auditorium

ORAL PRESENTATION AND PANEL DISCUSSION SCHEDULE

FOSTER ROOM

10:00-10:30 a.m.
The Death and Rebirth of Baseball in Worcester
Andrew O'Connor, Matthew Collamer
Faculty Advisors: Tom White, Julie Frechette, Ph.D.
Student Center, Foster Room

10:40-11:10 a.m.
Fear of Cybercrime among Worcester State University Students
Andro Hannoush, Ledy Richar, Paul Moraud
Faculty Advisor: Hyesun Kim, Ph.D.
Student Center, Foster Room

11:20-11:50 a.m.
Skateboarding, Do-It-Yourself Urbanism, and the Making of Neoliberal Public Spaces in Worcester, MA
Nicholas Beaudoin, Dannielle Morrow, Thomas Sedares
Faculty Advisor: Francisco Vivoni, Ph.D.
Student Center, Foster Room

12:00-12:30 p.m.
Globalization: The Intent to Destroy
Tiara N. Yahnian
Faculty Advisor: Henry C. Theriault, Ph.D.
Student Center, Foster Room

12:40-1:10 p.m.
HOT Team Works to Stop Alarming Drop in SNAP Caseloads
Danielle Albertson, Katie Cameron, Linda Carney, Kathleen Collins, Judy Knight, Nancy Leary, Maryellen Macuen, Sean Martin, Naomi Miller, Maria Navedo, Diane Parker, Joni Webster
Faculty Advisor: Maureen E. Power, Ph.D.
Student Center, Foster Room

1:20-1:50 p.m.
Fractals, Fibonacci, and Phi: Interesting Math from the Ancients to the Postmodern Era
Oliver Hammerle
Faculty Advisor: Maria Fung, Ph.D.
Student Center, Foster Room

2:00-2:30 p.m.
The Trouble with Hydrovite or Liberty's Balancing Act: Individualism versus Collectivism on the Moon
Oliver Hammerle
Faculty Advisor: Tona Hangen, Ph.D.
Student Center, Foster Room

FALLON ROOM

10:00-10:30 a.m.
Violence, Racial Profiling, and Community Police Tensions in Worcester, MA
Judeline Jeanbaptiste, Karena Nguyen
Faculty Advisors: Joyce Mandell, Ph.D., Michelle White, Ph.D.
Student Center, Fallon Room

10:40-11:40 a.m.
Slavery and Antislavery, Then and Now: A Roundtable Discussion
Amy Angell, Katherine Bunker, Jason Grant, Katherine Lavoie, Brian Meagher
Faculty Advisor: Karen Woods Weierman, Ph.D.
Student Center, Fallon Room

11:50-12:20 p.m.
Break the Silence with Their Words: Confronting Domestic Violence with Performing Arts
Maria Rose
Faculty Advisors: Lisa Kramer, Ph.D., Sam O'Connell, Ph.D.
Student Center, Fallon Room

12:30-1:10 p.m.
The Visual Framing of the Boston Marathon Bombings
Allyson Hassett, Sarah Reynolds
Faculty Advisor: Daniel Hunt, Ph.D.
Student Center, Fallon Room

1:20-2:20 p.m.
Global Service Learning: El Salvador
El Salvador Nursing Group
Faculty Advisor: Maryann Sabetti-Gramajo
Student Center, Fallon Room

2:30-3:00 p.m.
Heartland Jingoism: How Nashville's Cultural Narrative Explains Post-Flood Media Coverage in May 2010
Kaitlyn Benoit
Faculty Advisor: Tona Hangen, Ph.D.
Student Center, Fallon Room

Celebration of Scholarship and Creativity

Welcome to the eighth annual Worcester State University Celebration of Scholarship and Creativity. This special event is a highlight of our academic year because it provides an opportunity for us all to showcase the excellent work done by our students and faculty in the areas of research, scholarship, and creative projects.

Our University community takes great pride in the accomplishments and quality of our students and faculty in the various academic programs. Perhaps no other venue provides as comprehensive a picture of the quality as the Celebration of Scholarship and Creativity. The Celebration includes presentations from across the disciplines in the arts, humanities, social sciences, and natural sciences. These presentations range from research posters and analytical papers and panel discussions to performances.

One of the most impressive and engaging aspects of the special presentation is the opportunity afforded to meet and talk with the students and faculty whose creativity is on display. I especially encourage you to take the time to get to know some of these amazing young people—to hear about their backgrounds and interests and their aspirations for a future that builds on these accomplishments.

Even though the Celebration is a large event, it is really just a microcosm of the wide array of student learning and mentoring that our faculty provide every day in all of our academic programs. As you walk from presentation to presentation, you will see and hear really impressive examples of student learning outcomes from across the University. Please enjoy this 2015 edition of the Celebration of Scholarship and Creativity at Worcester State University.

David A. Caruso, Ph.D.
Interim Provost

WORCESTER STATE UNIVERSITY

BIOLOGY

Characterization of the *E. coli* gadA Promoter Using the pClone System
Emily Dennstedt, Vimbai Machapu, John Davis
Faculty Advisor: Jennifer Hood-DeGrenier, Ph.D.

The gad system in *Escherichia coli* works in acid shock resistance and can be activated by acid, osmotic, and stationary phase signals. Genes encoded by the gadA promoter include glutamate decarboxylase isozymes, which aid the cell in maintaining internal/external neutral pH. Our objective for this project was to test the ability of the gadA promoter to direct transcription in a pH-specific manner. Forward and reverse oligonucleotides corresponding to the gadA promoter sequence were annealed and inserted into the pClone-Red Synthetic Biology Tool using the Golden Gate Assembly method. To promote red fluorescent protein (RFP) expression, transformed *E. coli* cells were exposed to pH 2.5 or pH 7. RFP was expressed, indicating successful cloning, but surprisingly, expression was reduced under acidic conditions. Further studies may illuminate the reasons for this expression pattern.

Factors Contributing to the Onset of Type 2 Diabetes: Preventative Measures to Reduce the Risk in Shift-Workers
Protiva Dutta
Faculty Advisor: Latifeh Amini-Kormi, Ph.D.

Sleep deprivation causes physiological changes in the body that lead to impaired glucose maintenance. These physiological changes include increased cortisol levels, changes in circadian gene transcription of Bmal1 and CLOCK genes, and increased levels of leptin and ghrelin hormones. Understanding these risk factors can help employers adjust their work policies for the reduction and prevention of Type 2 diabetes among their employees, especially shift workers who are likely to experience disruption in their circadian rhythm. This poster will discuss measures that can be taken to prevent sleep deprivation.

Investigating the Hybrid Tac Promoter in *E. coli* Using the pClone Synthetic Biology Tool
Sharine Elliott, Rachel Hall
Faculty Advisor: Jennifer Hood-DeGrenier, Ph.D.

Synthetic biology is an emerging field that blends chemistry, engineering, computer modeling, molecular biology, and systems biology. A synthetic biological construct known as pClone makes bacterial colonies glow green from a green fluorescent protein unless an active promoter is inserted into the plasmid, which causes them to glow red from a red fluorescent protein. In this study, we tested a hybrid promoter called tac, which combines sequences from both the *E. coli* trp and lac promoters, and which is inducible with IPTG, a molecular analog of the natural lac inducer, allolactose. In this study, the tac promoter was introduced into the pClone construct using the Golden Gate cloning strategy, and the cloning products were transformed into *E. coli*. The success of the cloning and functionality of the promoter were tested by flurometry and PCR.

Comparison of Myosin Muscle Proteins in Wild and Farm-Raised Salmon and Shrimp
Caroline Keniston, Isadora Sena
Faculty Advisor: Ellen F. Fynan, Ph.D.

Animal movement is dependent upon muscle activity and, therefore, it is crucial to fully understand the mechanics and principles of muscle proteins and muscle fibers, which are composed of myosin and actin filaments. For this study, shrimp and salmon myosin were examined to determine whether or not their proteins differed if they were wild or farm-raised. Multiple samples of shrimp and salmon were obtained from different vendors to view similarities and differences within muscle proteins. The samples were collected and separated by protein gel electrophoresis. Samples were transferred to a membrane by western blotting to facilitate antibody detection of myosin, and the myosin light chain proteins of the wild and farm-raised salmon and shrimp were compared. Results and conclusions from this study will be presented.

Micronuclei Induction Effect of BPA in Vero Monkey Kidney Cells
Vimbai Machapu, Arthur Marka, John Pierce, Edward Poku
Faculty Advisor: Maureen D. Shamgochian, Ph.D.

Bisphenol-A (BPA) is a chemical widely used in the production of polycarbonate plastics and epoxy resins to which humans are constantly exposed via consumer products, including food and drink packaging as well as medical devices. Previous studies have shown that BPA is a reproductive toxicant that influences epigenetic cellular mechanisms in mammals. The cytokinesis-block micronucleus assay detects genotoxicity of chemicals through their ability to induce the formation of small membrane bound fragments that originate from chromosomes unable to migrate following mitotic spindle formation. This pilot study examines the effect of BPA on micronuclei induction in cultured Vero monkey kidney cells using a modified version of the cytokinesis-block micronucleus assay. Results of this study may lead to a novel bioassay protocol for the evaluation of potentially genotoxic substances.

Interactions Between Environmental Soil Microbes and the Antibiotic Producing Bacterium *Streptomyces coelicolor*
Isaac Ofori
Faculty Advisor: Roger S. Greenwell, Ph.D.

The soil bacterium *Streptomyces coelicolor* is an environmentally and economically important microbe known for its diverse life cycle, ability to produce antibiotics, and role as a saprobe. My research is focused on determining how *S. coelicolor* interacts and communicates with environmental microbes. I have cultured several environmental microbes and plated them in conjunction with *S. coelicolor*. A number of organisms have been identified that influence development (enhanced or inhibited growth) and antibiotic production (stimulated or inhibited) of *S. coelicolor* and I am now identifying the genus of the environmental microbes. My future work will be to isolate these secreted signal compounds and identify them by MS. These secreted compounds may include novel antimicrobial agents or chemical inducer/activators that can be further investigated for their active properties.

The Spread of *Hydrilla verticillata* and the Possible Ecological Implications for New England
Richard G. Ruby III
Faculty Advisor: Steven J. Oliver, Ph.D.

Hydrilla verticillata is a submersed aquatic macrophyte of the phylum Magnoliophyta (Masterson, J. 2007). It is native to Asia and parts of old world Europe (Langeland, K.A., 1996), and was introduced to the Southern United States at some point in the 1950's by people involved in the marine aquarium trade. Since then, this highly invasive plant has taken over waterways and lakes in approximately 25 of the lower 48 states, including Massachusetts (USDA 2015). The adaptations that *Hydrilla* has evolved give it the ability to invade non-native water bodies and alter the ecosystem drastically. *Hydrilla's* reproductive strategies allow it to proliferate both clonally and sexually. Its success could spell disaster for native aquatic ecosystems.

Exome Sequencing for Phylogenetic Classification of Laniatores
Stephen Simeone
Faculty Advisor: Sebastián Vélez, Ph.D.

While Laniatores *(Arthropoda arachnida)* has recently received taxonomic attention, molecular data is still needed to inform the more detailed internal relationships within the group. Sanger sequencing is used to obtain DNA data that can inform phylogenic relationships between taxa, but next generation sequencing (NGS) techniques have recently been employed to bring more data to orders of magnitude in order to solve these phylogenetic relationships. In this project, a new whole genome sequencing protocol was developed, including the optimization of DNA purification protocols and DNA library construction. Future work will involve enrichment of the genome in targeted regions through long PCR and partial genome sequencing followed by bioinformatic analysis. This methodology will aid in the elucidation of novel phylogenetic associations between species and will complement existing morphological observations to provide a higher resolution phylogeny of Laniatores.

The Study of Some Soil Organisms at the Community Harvest Project in North Grafton, Massachusetts
Han Vo
Faculty Advisor: Peter M. Bradley, Ph.D.

The purpose of my internship at the Community Harvest Project was to learn about community farming, non-profit service, nutrition, and soil properties. Healthy soils contain many organisms, and some arthropods were isolated from soil samples using the Berlese-Tullgren funnel method and then examined with Worcester State University's scanning electron microscope, which found isopods, mites, millipedes and other organisms. Other activities during the internship included cleaning and packing produce, organizing a field day for fundraising, and teaching a group of fifth-grade students. The farm focuses on planting crops, hydroponics, growing organic vegetables, educating elementary students, and engaging in community outreach to the Worcester County Food Bank and Central Massachusetts.

BIOTECHNOLOGY

***Cellulomonas flavigena* as a Bio-fuel Source**
Melina Gjoni
Faculty Advisor: Maura Collins Pavao, Ph.D.

Microbes in the soil have the ability to transfer electrons to a titanium wire in a microbial fuel cell, thereby generating electricity as electrons are pulled from the anode to the cathode. The organisms (including both aerobes and anaerobes) often grow on the anode, forming biofilms as part of the process. This study examines the organism *Cellulomonas flavigena,* an aerobic bacterium known for its degradation of cellulose and hemicellulose, and its ability to generate electricity. To determine this, sterile soil was inoculated with *C. flavigena* and placed in a Mudwatt fuel cell. Over a period of seven days, voltage from the Mudwatt was recorded, and a maximum level of 378 mV was observed. Since *C. flavigena* formed a biofilm, further studies were performed to characterize it, which demonstrated that *C. flavigenia* was an electrogenic bacterium that has the potential as an alternative fuel source.

Activation of the Response Regulator RamR in *Streptomyces coelicolor*
Taylor Perkins, Joseph Girouard
Faculty Advisor: Roger S. Greenwell, Ph.D.

The bacterium *Streptomyces coelicolor* is known for antibiotic production and its complex developmental life cycle. We are investigating the biosynthesis and regulation of the secreted peptide SapB, a biosurfactant needed for the life cycle of these filamentous bacteria. The response regulator RamR controls the production of mature SapB in vivo, and we are investigating the mechanism by which RamR is activated. Cells expressing RamR mutants generated at potential sites of phosphorylation are being analyzed for mature SapB production via Western blot analysis. We also sought to identify the RamR-activating sensor kinase since there is no adjacent kinase to the ramR gene. There are 19 orphan kinases in the genome of *S. coelicolor,* of which we have 11 distinct kinase-null mutants that are being tested for mature SapB production via Western Blot. These experiments will provide insight into the function of RamR in the production of SapB.

Environmental Effects on the Bioluminescence of *Pyrocystis fusiformis*
Kiran Sewsankar, Gent Imeraj
Faculty Advisor: Maura Collins Pavao, Ph.D.

Pyrocystis fusiformis is a unicellular eukaryotic alga and is part of the dinoflagellate phylum. This species has the ability to produce a blue bioluminescence during the night cycle from mechanical and/or chemical stimulation in response to movement or other membrane disturbances naturally developed for signaling and protection from predators. In this experiment, the growth rate and bioluminescence of *Pyrocystis fusiformis* was tested in response to being grown on a magnetic field using permanent magnets. Bioluminescent levels were also tested in the presence of various sound frequencies, produced by a tone generator, and different chemicals inducing action potential. Cells were cultured with Li-Si medium in a light chamber with a 12-hour light/dark cycle to maintain a circadian rhythm. The luciferase complex mechanism found in the species could provide better results in the bioengineering of bioluminescence in plants.

Role of Phosphorylation in Cell Division of Budding Yeast
Hieuhanh Nguyen, Emily Dennstedt
Faculty Advisor: Jennifer Hood-DeGrenier, Ph.D.

The focus of our study is the characterization of the role of Clb2/Cdc28-mediated phosphorylation of two proteins (Bud3 and Bni4) in *Saccharomyces cerevisiae*, or budding yeast. The Bud3 protein is necessary for determining the axial pattern of bud sites in haploid budding yeast cells. We are investigating the role of Clb2/Cdc28-mediated phosphorylation at three specific sites in Bud3 and whether the phosphorylation state of any or all of these sites affects the normal role of Bud3 in bud site selection. The Bni4 protein has known roles in the assembly of the chitin ring and septum. Additionally, Myo3 and Myo5 myosin proteins, which are involved in cytokinesis, have been co-purified with Bni4. We are attempting to confirm the Bni4-Myo5 interaction and to test whether Clb2/Cdc28-mediated phosphorylation disrupts this interaction. This may increase our overall understanding of the regulatory mechanisms involved in cell polarity determination and cell cycle progression.

BUSINESS ADMINISTRATION AND ECONOMICS

On Guard Initiative/ Enactus 5K
Brian Ciaccio, Thomas Jacobsen
Faculty Advisor: Joan Mahoney, Ph.D.

The risk of suicide among corrections officers is 39% higher than average for other populations. Post-traumatic stress disorder, abuse, and divorce rates are also greater than those in the general working population, with an average life span of a corrections officer of 57 years. The On Guard Initiative was created as a non-profit foundation to raise awareness about mental health and suicide prevention amongst corrections officers. This initiative provides over 5,000 officers at over 25 facilities a voice they did not have before; one that is not concerned with job security or repercussions, but rather with providing a way to cope with a tragic situation. On April 26th, 2015, Enactus will assist in coordinating and expanding the 3rd Annual On Guard 5K Road Race, which will be held on Worcester State's campus and continues to be On Guard's most important yearly fundraiser.

Reyes House: Financial Literacy
Frederick Kobea, Raphael Nunez, Monica Bhakhri, Amber Suarez
Faculty Advisor: Joan Mahoney, Ph.D.

We have partnered with the Hector Reyes House, a non-profit organization serving Hispanic men undergoing substance abuse recovery. These men are motivated to get and stay clean by the desire to support their families and live a normal, productive life. To do so, they need a number of life skills, including financial literacy. Our team investigated available options, examined the length of stay and educational levels, and tailored a specific financial literacy program for the Reyes House. It was developed in Spanish and included realistic, local examples of everyday financial decisions. Since its inception, our program has shown significant improvements in client knowledge. Results presented will include both preliminary and secondary tests, and we will discuss the methodology employed and the next steps planned, as well as what we learned during the process.

Straight Ahead Ministries Project
Michael Hogan, Cameron Fortes, Daniel Figueiredo, Dana Perry, Thomas Jacobsen
Faculty Advisor: Joan Mahoney, Ph.D.
A Commonwealth Honors Project

Our team is consulting for Straight Ahead Ministries Inc., which operates three social entrepreneurship ventures – a café, a catering service, and a consignment store—on the 790's block of South Main Street in Worcester, Massachusetts. Each of the ventures employs youth ex-offenders and provides services such as mentoring/life coaching, educational opportunities, and job readiness training. Our Enactus team has analyzed the marketing and social media presence for each venture, explored alternatives and identified the cost/benefit of various marketing strategies, and assisted them in improving upon their current social media name recognition and marketing campaign. With a $1,500 grant from Sam's Club, we helped this small business in all of these aspects this year. There is a mutual benefit in this project for Straight Ahead Ministries and our team, where the former is able to improve their marketing presence and the latter gets hands-on experience in consulting for a small business.

ESL Financial Literacy
Jean Phillippe Matondo, Brittany Desilets, Vernan Aurelio
Faculty Advisor: Joan Mahoney, Ph.D.

Financial literacy is necessary for success. Those who move to America have the task of adjusting to a different financial system and learning the English language. The ESL Financial Literacy Workshop addresses both areas by providing a hands-on experience for ESL students to learn money management skills while perfecting their English. Using various tools, the ESL students are taught a variety of topics. Guest speakers from local businesses attended workshops to provide the students with real world information. The curriculum for this program targeted the demographic of those who attend ESL classes at Worcester State's Latino Education Institute. Our collaboration was successful in finding participants and selecting those whose English skills were proficient enough to understand the concepts, and, as a result, their financial knowledge was vastly improved. Financial skills are a necessity for all demographics, and working with the ESL students at Worcester State has proven the importance of this education.

Analysis of Survey Data for Junior Achievement's "My Dream, My Future" Program
Ara Nerssessian
Faculty Advisor: Elizabeth J. Wark, Ph.D.

Students of Professor Wark's BA916 Quantitative Analysis class were introduced to managerial decision modeling and used Microsoft Excel to solve a variety of mathematical equations, such as linear programming, forecasting, and simulation models, all of which are critical to running a successful business. To demonstrate how these various mathematical models pertain to business, Professor Wark has partnered with Junior Achievement of Western Massachusetts. Junior Achievement provided our class with data from its volunteer and teacher surveys, and, for a class project, we provided data analyses of current operations. My project was analyzing the surveys collected from the "My Dream, My Future" conference. Using both Powerpoint and Excel, I presented the data collected in a variety of forms, such as pivot tables, charts, and various statistics.

Trew Friends
Andrew Ngo, Jemini Patel
Faculty Advisor: Joan Mahoney, Ph.D.

Trew Friends is a chapter-based, student-run community of young people that operates across the nation. An extension of The Heather Trew Foundation for Organ Donation and Research, local chapters of Trew Friends work in unison and follow the same mission while networking with state and local agencies, nonprofits, and community partners. We focused on six goals: (1) launching a university-wide call for interest among students; (2) identifying potential student leaders and securing a faculty advisor; (3) leading the group in organizing and writing a chapter charter; (4) getting recognized as an official chapter of the Heather Trew Foundation and at our university; (5) coming up with new ideas to create awareness on and off campus; and (6) increasing the number of national organ donors through chapter efforts. We have completed the first four goals, and are currently in the process of developing information campaigns.

Café Reyes
Amber Suarez, Heather Wilson, Monica Bhakhri, Tiffany Marquez
Faculty Advisor: Joan Mahoney, Ph.D.

Enactus is an international student organization that is dedicated to service learning through the power of entrepreneurial action, and aims to transform lives through empowerment. As members, we worked closely with the Hector Reyes House, a local non-profit organization located in Worcester, Massachusetts. Reyes House provides a rehabilitation and substance abuse recovery program for adult Hispanic males and has recently launched a new full-service restaurant and catering social-entrepreneurial venture. Through innovative marketing and public relations, our project focused on successful grand openings and sustainable marketing pulses. We will highlight the various marketing tools and techniques employed and present available metrics. We will also discuss the research and benchmarking behind the creation of Human Resource information pamphlets that are designed to teach and reinforce basic employment and customer service principles.

CHEMISTRY

Reactivity of Nitroxyl (HNO) to Glyceraldehyde-3-phosphate Dehydrogenase in Different pH Conditions
Emmanuel Armanious, Colleen Au
Faculty Advisor: Susan M. Mitroka, Ph.D.

Glyceraldehyde-3-phosphate dehydrogenase (GAPDH) is an enzyme involved in glucose metabolism for cells. The enzyme involves the reduction of the co-enzyme NAD+ to NADH, allowing this reaction to be monitored by UV-Vis spectroscopy. The reactivity of Nitroxyl (HNO) [the electron reduced and protonated cousin to nitric oxide (NO)] against the enzyme GAPDH was tested in different pH conditions, and the pH of the reaction conditions varied from 7.4 (physiological pH) to 8 and 10. Nitroxyl inhibits the activity of GAPDH by acting as an electrophile to the enzyme's cysteine group and induces the inhibition of GAPDH and NADH production. Biologically, this reaction would halt the energy production of ATP for cells, which makes it an attractive anti-cancer target.

Proposing Cancer Treatments Through the Investigation of Nitoxyl (HNO) Reactions with Target Biological Processes
Brianna Brosnan, Tasneem Zawahreh
Faculty Advisor: Susan M. Mitroka, Ph.D.

Nitroxyl (HNO) is the simplest nitroso compound that reacts as a potent electrophile and rapidly forms addition products with nucleophiles, particularly thiols, leading to enzymatic inactivation of many proteins. Although little is known about the reactions of selenium-based compounds and HNO, the basic chemical properties indicate selenium-containing proteins are preferred targets of HNO. Thioredoxin Reductuctase (TrxR) is involved in many cellular regulatory processes, such as cell proliferation and apoptosis. These enzymes are particularly important in cancer chemistry for the role they play in preventing apoptosis. The upregulation of TrxR is found in a variety of cancer cells, both in vitro and in vivo, and several TrxR inhibitors are currently being tested as possible cancer therapeutics. Given the unique chemical nature of the enzyme active site, irreversible modification through an electrophilic agent promises to be a viable means of deactivating the protein. Our project focused on HNO's ability to inhibit TrxR1 activity.

C-H Activation of Pyrdine via Boryl Cyclopentadienyl Transition Metal Complexes
Alexander Carl
Faculty Advisor: Jeremy R. Andreatta, Ph.D.

Pyridine rings and other heterocycles are key components in many pharmaceutical ingredients. The aromatic ring's stability, however, leaves it resistant to substitutions and transformations without resorting to harsh reagents and reaction conditions. The purpose of the complexes synthesized in this project is to provide a greener pathway to the alkylation of pyridine. The catalysts created were transition metal boryl cyclopentadienyl complexes, the first being cymantrene based, [(η5 -C5H4)B(Ph)2Mn(CO)3]. IR spectroscopy was used to ensure the successful synthesis of the complex by identifying and comparing the carbonyl stretches. Taking advantage of the boryl group's lewis acidity, the complex is able to coordinate pyridine's nitrogen. Photolysis of the compound in the presence of ethylene is aimed at activating a C-H group of pyridine and catalyzing the alkylation reaction.

Synthesis and Applications for Graphene in Electrochemical Systems
Gert Dervishaj, Benjamin Lauchart, Alexander Carl, Carl Clermeus
Faculty Advisor: Joseph Quattrucci, Ph.D.

Graphene is a promising component for electrochemistry due to its exceptional electrical properties. Electrochemical batteries are driven by chemical reduction and oxidation of an anode and cathode and limited in voltage by a standard electronic potential between the working electrodes. Since graphene is highly conductive but has no reduction potential on its own, layering or incorporation into these metals can yield the benefits of increased electron flow while still being reducible, thus creating a stronger battery. Graphene was synthesized through chemical oxidation, exfoliation, and reduction of graphite, confirmed using IR spectroscopy, and applied to a zinc cathode using various techniques. The graphene doped cathodes against a copper anode gave a net increase in standard potentials versus a plain zinc cathode, indicating a slight performance increase for graphene doped small scale electrochemical systems. This result implies that graphene can be used in larger scale batteries and eventually used in commercial products.

Levels of 17β-estradiol Estrogen on Surface Water
Francini Fonseca
Faculty Advisor: Kathleen C. Murphy, Ph.D.

Recent studies have shown that estrogen present in surface water, even at parts per trillion levels (ng/L), can have an adverse effect on the development of aquatic species. This experiment quantified the estrogen levels of 17β-estradiol, also known as E2, in surface water and sediment samples collected throughout Central Massachusetts by using an Enzyme-Linked Immunosorbent Assay (ELISA) kit for analysis. Sewage entering the Worcester Water Treatment Plant (WWTP) had E2 levels of 32 ng/L and post-treatment effluent levels were 11 ng/L. The sediment collected up and downstream from the WWTP also had quantifiable levels of estrogen, but water and sediment from local farms had E2 levels below the detection limit. Blanks and spikes confirmed the accuracy of the method. Proposed future work is to resample and analyze WWTP and other local farms, and then to investigate the effect of measured E2 levels on the development of indigenous aquatic life.

Enthalpy of Vaporization by Gas Chromatography
Linh Huynh, Kaleigh Ryder, Gina Molinari, Ramtha Lahdo
Faculty Advisor: Joseph Quattrucci, Ph.D.

Enthalpy of vaporization (ΔvapHo) signifies how much heat is required to convert a liquid into a vapor. This allows for the estimation of the boiling point and provides an indication of the type and strength of intermolecular forces. The aim of this project is to use the gas chromatograph—mass spectrometer (GC-MS)—to determine the ΔvapHo of various volatile compounds such as dipropyl ether, chloroform, and naphthalene, which can be related to the intermolecular interactions between the molecules. This experiment is helpful in understanding the role of a structure to its thermodynamic properties for undergraduate physical chemistry students.

Quenching of Benzophenone Triplets by Naphthalene
James Marsden, Mohamed Eldam, Phi Li
Faculty Advisor: Joseph Quattrucci, Ph.D.

In some cases, the long-lived excited state of a molecule has a greater potential for chemical reactions compared to its ground state. In this experiment, we investigate the hydrogen abstraction from various solvents by benzophenone in its excited state. The rate constant for hydrogen abstraction can be determined by introducing a quencher at known concentrations. The rate constants are qualitatively related to the hydrogen's bond dissociation energies within the solvents.

Effects of Chlorine Dioxide Exposure on Polymeric Water Bottles via Accelerated Aging
Kayla Paradis
Faculty Advisor: Susan M. Mitroka, Ph.D.

Hikers on prolonged expositions require a means to purify untreated water. Some purification reagents are very strong oxidizing agents that have the potential to react with polymer-based water bottles, producing unwanted side products and reducing the polymeric strength of the bottles. Our research examined the effects of chlorine dioxide, a common water disinfectant and oxidizing agent, on polymeric water bottles. Using accelerated aging conditions, the effects of repeated exposure of chlorine dioxide to the polymer structure of several water bottles was investigated as well as the water parameters of using chlorine dioxide as a disinfectant. The research specifically focused on testing treated water for pH and total chlorine concentration changes, detection of physical changes to polymer material through IR, and measuring potential weight loss from samples after repeated exposure.

Immobilization of Enzyme in Cellulose/IL Film
Jeff Purslow
Faculty Advisor: Meghna Dilip, Ph.D.

Immobilization of enzymes can cause retention of enzymatic activity even under non-ideal conditions. In this poster, the immobilization of laccase (in a cellulose matrix) assisted by ionic liquid (1-butyl 3- methyl imidazolium chloride) was investigated. Enzyme activity under different conditions was tested using a syringaldazine assay. Additionally, the films (incorporating immobilized enzymes) were tested for their ability to degrade azo and triphenylmethane dyes.

Theoretical Investigation of Molecular and Atomic Hydrogen Dissociation on Metal Decorated Carbon Nanotubes
Brian Walker
Faculty Advisor: Joseph Quattrucci, Ph.D.

Over the past few decades, hydrogen has been studied as an alternative to fossil fuels since it is a renewable source of energy that is environmentally friendly. It also contains more energy by weight than traditional fossil fuels. However, methods of storing atomic hydrogen are economically inaccessible for the everyday consumer. Studies have shown that carbon nanotubes (CNT) have the potential to store hydrogen and current research is focused on investigating the hydrogen storage potential in CNTs. It has been shown that a metal catalyst such as nickel can facilitate the binding of hydrogen to CNTs via the spillover mechanism. The purpose of this research is to calculate, using the Vienne Ab-initio Simulation Package (VASP), the energetics of molecular and atomic hydrogen interacting with a carbon surface, nickel interacting with a carbon surface, and hydrogen interacting with nickel adsorbed to a carbon surface. It will then be possible to create a potential energy surface associated with the dissociative adsorption process.

Bis-PTA Pincer Complex for Catalysis in Water
Kenneth Zielinski
Faculty Advisor: Jeremy R. Andreatta, Ph.D.

Due to the increasing restrictions associated with use and disposal of organic solvents in industry, there has been a piqued interest in the development of catalysts that can function in or are soluble in water. Previously, the water-soluble phosphine PTA (PTA = 1,3,5-triaza-7-phosphaadamantane) has been used as a neutral monodentate ligand to impart water solubility to transition metal complexes; however, some of these complexes suffer from unpredictable reactivity (such as isomerization) or catalyst decomposition under the reaction conditions required for catalysis. Therefore, the development of water-soluble multidentate bis-PTA PXP (X = C or N) pincer ligands and subsequent metal complexes could lead to a new and useful class of catalysts for a variety of transformations in either aqueous or biphasic media. Specifically, hydrogenation of abundant, cheap, and relatively inert carbon dioxide in aqueous medium would provide a more novel and environmentally benign application for such complexes.

Photochemical Upconversion of [Ru(bpy)3]2+ with DPA Technological Advancements to Solar Power Generation
Kenneth Zielinski, Endrit Theodori, Neil Chapin
Faculty Advisor: Joseph Quattrucci, Ph.D.

Photochemical upconversion is a process in which low-energy photons are converted to high-energy photons. This process has great potential for capturing the sun's spectrum and making use of it for consumers. In this experiment, [Ru(bpy)3]2+ is used as the chromophore, which absorbs light energy. The upconversion process requires the excitation of the chromophore to act as a donor that can transfer energy to the acceptor molecule, which in this case is 9'10'-diphenylanthracene (DPA), also known as triplet-triplet energy transfer. As the excited acceptor interacts with other excited acceptors, triplet-triplet annihilation can occur and the resulting fluorescence will becomes Anti-Stokes shifted or higher in energy than the initially absorbed light. The emission of the transformed energy versus the unconverted incident light can be analyzed and studied while the rates of the energy transfers can be determined using the Stern-Volmer relation. This experiment also investigates the photochemical upconversion alongside the rates of the energy transfers.

COMMUNICATION

***Censored 2015* Book Chapter & Journal Article**
Julie Frechette, Ph.D.

Julie Frechette published a chapter in the award-winning book, *Censored 2015: The Top Censored Stories and Media Analysis of 2013-2014* (7 Stories Press). Co-written with Rob Williams, Frechette's chapter is entitled "Action Coalition for Media Education (ACME): Smart Media Education for the Twenty-First Century." Recently awarded the 2014 Pillar Award for New Media and Journalism, the book is celebrated as the nation's oldest news-monitoring project. Every year since 1976, Project Censored has produced a Top-25 list of underreported news stories as well as the book, *Censored*, which is dedicated to the stories that ought to be top features on the nightly news, but are missing because of media bias and self-censorship. Frechette also published the journal article "Top Ten Guiding Questions for Critical Digital Literacy in the Journal of Media Literacy" 61 (1&2). Madison, WI: National Telemedia Council, Inc.

The Visual Framing of the Boston Marathon Bombings
Allyson Hassett, Sarah Reynolds
Faculty Advisor: Daniel Hunt, Ph.D.

This study evaluates how news organizations throughout the United States handled the reporting of the Boston Marathon bombings and their aftermath. Applying content analytic procedures, the front pages of app. 400 newspapers were analyzed for their coverage in the days following the bombings, April 16, 2013 through April 20, 2013. The photographs, headlines, and captions were coded based on themes represented within these texts. There were framing variations amongst the newspapers throughout the week based on factors such as proximity, format, and the use of graphic images. In relation to the images presented on any given day, most newspapers chose to display similar visual images to represent the event. It should also be noted that some other news organizations chose to use original images with local ties to their geographic location and local communities.

Curation of the History of Comics and Sequential Art
Alex MacDougal
Faculty Advisor: Barbara Zang, Ph.D.

This exhibit documents the history of comic books and sequential art. I created it during the Fall 2014 Editing course due to my strong interest in the comics medium. While still thought of as a relatively new form of expression, comics and related sequential arts have existed in various forms for more than a millennium. My curation focuses on the modern development of the medium, beginning with the "Golden Age" comics of 1930's—the era which introduced Superman and Batman—followed by the "Silver Age" works of Stan Lee, and the "Bronze Age" that introduced more realistic work. I also recognize foreign comics artists who have made a great impact on the medium, such as the Italian Hugo Pratt and the Japanese manga artist Osamu Tezuka. Also included are some general resources, such as Comic Book Resources and the Grand Comics Database.

Writing Matters
Isaiah Mutesasira
Faculty Advisor: Barbara Zang, Ph.D.

"Writing Matters" is a Fall 2014 independent study and video project that highlights the importance of good writing skills among WSU alumni in various professions. The alumni who were interviewed say that many college students and other young adults lack good writing skills. Students ignore developing these skills, and this deficit may harm them in their search for employment. The alumni featured in the video include: Dave Bedard '74, account executive, Charter TV 3; Craig Bovaird '77, owner & president, Built Rite Tool and Die Reliance Engineering, Inc.; Jill Dagilis '78, executive director, Worcester Community Action Council, Inc.; Sharon McDonald '86, grant writer, Worcester State University; and Hilda Ramirez '01, assistant director, Latino Education Institute.

The Death & Rebirth of Baseball in Worcester
Andrew O'Connor, Matthew Collamer
Faculty Advisors: Tom White, Julie Frechette, Ph.D.

Our group will present our short documentary *The Death & Rebirth of Baseball in Worcester*, which is a current finalist in the NESN Student Film Contest. It will be featured on NESN's show *NESN's Next Producer,* which premieres April 6 following Boston Red Sox coverage. The film documents independent baseball in Worcester over the last few seasons along with a few other surrounding issues in the city, eventually leading up to the 2014 championship season of Worcester's new team, the Bravehearts. In the film, the Bravehearts' owner, general manager, coach, players, and Mayor Joseph Petty are interviewed about the team. The exhibition will include a screening of the six-and-a-half minute film in hopes of receiving feedback from peers and professionals.

COMMUNICATION SCIENCES AND DISORDERS

Communicative Acts of Children at Risk for CCN in Familiar Play With and Without AAC
Erin Aleicho, Laurissa Galipeau, Brooke Talcott, Paul Morris
Faculty Advisor: Kara Medeiros, Ph.D.
A Commonwealth Honors Project

This study was based on the data of 25 young children at risk for being non-speaking. Young children and maternal caregivers were recorded on video for 5-10 minutes in familiar play, both with and without a single-message aided AAC device that was programmed to say "more." Medeiros & Cress (2011) found maternal responsiveness to increase significantly (P>.05) when children used the AAC device during familiar play. This study sought to further examine the effect by examining the children's communicative acts. There were three types of these acts that were coded, including verbal, gestures, and AAC use. Data was coded every 10 seconds and a ratio of acts per minute were computed for comparison. Four lab assistants were trained to be reliable on the coding scheme, with at least 80% being reliable. A one-way ANOVA will be used to compare communicative acts per minute in familiar play, both with and without aided AACs.

Ears for Listening, Voice for Speaking
Molly A. Butkiewicz, Mollie E. Sydlowski
Faculty Advisors: Susanna E. Meyer, Ph.D., Ann T. Veneziano-Korzec, MS, CCC-SLP

ELVS is a prevention program designed to teach children about hearing conservation and vocal hygiene. Research has shown that this age group is highly susceptible to premature hearing loss, caused by exposure to loud sounds, and vocal abuse, caused by inefficient use of the vocal mechanism. However, early awareness of these unhealthy behaviors has helped children prevent future communication disorders in these areas. The ELVS program was presented to seventeen different preschool and kindergarten classrooms and featured Dr. Seuss's *The Lorax*, which encouraged the students to take responsibility for their voice and their ears. Students were taught how to protect their voice and their ears through an interactive program. This program required each student to participate in activities such as assessment tasks, a life-size pathway of the ear, and a mock hearing screening activity.

Investigating the Role of the Speech-Language Pathologist
Loren DeLisle, Taylor Trangese
Faculty Advisor: Susanna E. Meyer, Ph.D.

Two undergraduate Communication Sciences and Disorders majors have been shadowing speech-language pathologists (SLPs) in various settings. The students observed and participated in therapy in an early intervention (EI), a preschool, and elementary school setting. Students attended the therapy sessions weekly for 4-5 hours. In EI the one student observed children between 18 months and 3 years. Therapy takes place in the child's home. The student observed 12 children with articulation problems, global delay, velopharyngeal disorders, and Autism. Parent engagement is an important component of the therapy. The second student shadowed SLPs in the preschool and elementary school settings where children are between 4- 8 years. Services are provided individually or in small groups. The student observed 15 children with articulation, language, social communication disorders, and Autism. The SLPs assign weekly homework and send notes home with the homework assignments. Both students gained knowledge and insight in the role of SLPs.

Noise Exposure in Retail Stores
Kerrilyn McGowan
Faculty Advisor: Susanna E. Meyer, Ph.D.
A Commonwealth Honors Project

Noise-induced hearing loss (NIHL) is one of the most common workplace injuries and the second most reported occupational injury. The National Institute for Occupational Safety and Health (NIOSH) has regulated the duration of noise exposure levels in workplace environments. However, there is currently no research that focuses on the noise levels in retail stores. The goal of this study is to determine whether the noise levels in retail stores is considered "safe" according to NIOSH standards. Recordings of environmental sounds lasted 11.5 minutes and were taken using an Etymotic Research, Inc. Personal Noise Dosimeter on three different days in six stores, which were selected to represent both adult and teenage clientele. The noise levels in each store were recorded, averaged and compared to the recordings of other stores as well as to the NIOSH standards. The results of the research are discussed and related to risk of NIHL for employees.

Trisonomy 21 and the Prevalence of Superior Canal Dehsicence
Paul Morris
Faculty Advisor: Keith Darrow, Ph.D.
A Commonwealth Honors Project

Trisonomy 21, a form of Down syndrome (DS), is characterized by varying degrees of cognitive delays and anatomical abnormalities. While numerous studies have examined aural abnormalities in this population, few have investigated the prevalence of superior canal dehiscence (SCD), a condition caused by a thinning or absence of the temporal bone overlying the superior canal. SCD presents with multiple auditory and/or vestibular symptoms, including autophony, pulsatile tinnitus, and provoked dizziness. SCD etiology is not understood; however, there are indications that patients born with a thin skull base are at increased risk of dehiscence. The anatomical abnormalities in the DS population may be a risk factor for development of SCD. A retrospective review of pediatric DS patients from Massachusetts General Hospital was performed. Patients with an audiogram and temporal bone (TB) CT scans were included. Clinic notes, hearing loss, and TB-CT scans were examined to determine the prevalence of SCD. Of the 103 patients with DS, three demonstrated thin and one a dehiscent superior canal. Three of these patients had a low frequency conductive hearing loss. None reported symptoms of SCD. No patients reported symptoms of SCD, but their age and underlying cognitive delays may prevent accurate description of symptoms. Longitudinal follow-up of these patients may reveal progression to symptomatic SCD. Additional testing, including cervical vestibular evoked myogenic potentials could help identify SCD in the DS population. Further investigation will be valuable in elucidating the relationship between DS and SCD to guide future clinical practice.

COMPUTER SCIENCE

An Experiment in Integrated Teaching to Improve Student Retention Using Common Problem Sets
Elena Braynova, Ph.D., Aparna Mahadev, Ph.D.

Data Structures ranks as one of the most challenging courses in our Computer Science curriculum and has the steepest learning curve for our students. To improve retention in this course, the authors attempted several approaches over the years, including: reorganization of the course sequence, reordering coverage of topics in both courses, changing pre-requisites and credit hours in both courses, requiring weekly blogs, and using common problem sets in both courses. In this presentation, we share our integrated approach and the benefits and shortcomings of our approaches over the years. We share the results of a student survey we developed to assess our latest approach. The survey results show that our attempt to integrate the two courses using common problem sets shows promise. In the future, we plan to use common problem sets in conjunction with weekly student blogs in the data structures course as well as in other courses.

Predicting Patient's Post-Operative Recovery Area Using Data Mining Techniques
Hebron Lorenzo, Sonia Paulino
Faculty Advisor: Elena Braynova, Ph.D.

In this project we study a medical dataset for patients after a surgery procedure and try to predict when a patient can be discharged based on their medical conditions. The dataset analyzed in the project has 90 instances and is described by 9 attributes. We analyze a classification problem for patient-discharged decision and construct classifiers using several models to evaluate their performance. We found that Decision tree-based learning outperforms Random Forest, Rotation Forest, and Naïve Bayesian classifiers, among others, in predicting discharge decisions. The data cleaning method improves the performance of learning method. Using these data mining techniques, we were able to extract useful information and draw an accurate model to predict discharge decisions.

Researching Heart Disease Data Using Data Mining Methods
Christopher Mitchell, Amin Naishadh
Faculty Advisor: Elena Braynova, Ph.D.

The main purpose of this project is to study the correlations between certain medical parameters and having heart disease. We focused on classification problems for having or not having heart disease and split the initial dataset into thirteen subsets based on patients' age, sex, chest pain, blood pressure, cholesterol, blood sugar, heart rate, and exercise. We constructed and analyzed classifiers using different models and different algorithms for each of the chosen models. For each of the dataset groups, we try to identify which of the patients' characteristics were strongly correlated to having heart disease and would more likely determine the diagnosis. Some of questions that we studied include: Are males or females more likely to contract heart disease? Are people older than the age of fifty-three more susceptible to heart disease? Is there a correlation between high chest pain and heart disease?

Diabetes: What May Cause It?
Emily Paiz
Faculty Advisor: Elena Braynova, Ph.D.

In this project I researched a medical dataset for patients with diabetes. The dataset contains several attributes for patients, including age, skin fold thickness, number of pregnancies, body mass index, diastolic blood pressure, plasma glucose concentration, serum insulin and diabetes pedigree function. I studied the attributes relationships and tried to figure out if any of them could be used to determine if a patient has diabetes. I also focused on the effect of non-medical attributes: age, number of times pregnant, and body mass index. The classification problem for "having/not having diabetes" was solved using a variety of models and running them on a variety of subsets of the original dataset. After constructing the classifiers and evaluating them for accuracy, I discovered that the dataset partition triumphed in accuracy. After omitting each non-medical attribute one by one, classifiers accuracy did not change significantly to identify a diabetes class.

CRIMINAL JUSTICE

Fear of Cybercrime among Worcester State University Students
Hannoush Andro, Richard Ledy, Paul Moraud
Faculty Advisor: Hyesun Kim, Ph.D.

We are increasingly becoming an information-based society that is exchanging information, knowledge, and building relationships in cyberspace. Computer and Internet usage have become an essential part of college education and we cannot imagine a day without using these outlets on campus. With the increased use of information technology on a daily basis, criminal activity in cyber space—known as "cybercrime"—becomes a serious concern to individuals and society. This study intends to conduct a survey with WSU students to measure their awareness and fear of cybercrime, which can be predicted by perceived cybercrime seriousness, perceived risk of victimization, and victimization experience. We will also discuss the definition, origin, technology, and evolution of cybercrime by reviewing established studies and literature about the subject. The findings of this study will help to understand the extent of cybercrime victimization and the level of fear about cybercrime on the WSU campus.

EDUCATION

Neuropsychology of Intellectual Disability
Courtney Allain
Faculty Advisor: Diane Tighe Cooke, Ph.D.

The purpose of this poster is to explore the neuropsychology of intellectual disabilities. A person with an intellectual disability is defined as an individual who experiences difficulties with the rate of learning, forming and applying judgment, creating organizational patterns of learning, developing adaptive skills, and understanding abstract concepts. The neurological deficits involved in intellectual disabilities include memory functioning, which impacts an individual's ability to develop typical cognitive and functioning skills, as well as the inability to meet developmental standards. This poster addresses the etiology, characteristics, medical concerns, legal and educational considerations, insurance coverage, treatment, and resources that are available for individuals with intellectual disabilities and their families.

Dealing With Diversity in Schools: A Universal Blueprint
Zach Besaw, Kim O'Dea, Alyssa Burek
Faculty Advisor: Kirby L. Wycoff, Psy.D., NCSP

Diversity is something that affects schools across the U.S., and each school needs a plan for dealing with diversity in gender, sexuality, race, ethnicity, and religion. This plan needs to be implemented in a multiple-step process in order for it to succeed. The process must create separate plans for teachers, students, and the community so the groups can be acclimated at their own pace. Steps should include setting up leadership teams within each group, meetings for group members to voice their opinions, and a strong policy to support the introduction of this new system. If districts adapt to this policy, they can become significantly more accepting of all students and facilitate a better learning environment for all. Our goal is to make everyone in any school district comfortable with their identities and how they learn. This poster will describe our plan to achieve this goal.

Educate, Understand, Improve
David Depatie, Anthony Camoreyt Jr., Maria Zammarelli, Cameron Nace
Faculty Advisor: Kirby L. Wycoff, Psy.D., NCSP

Schools across the country need to be accepting of students who are struggling with their gender identity and/or sexuality. Parents, faculty and students need to be educated on these topics in order to accommodate those going through these types of changes. The purpose of this poster is to make everyone aware of this ongoing problem of inequality in schools, and to educate those who are lacking the knowledge to handle these situations. Educating a person on topics such as sexuality and gender questioning is key for school systems to become more accepting. All students should feel safe in school, so we must educate all those involved in the school system on these topics in order to make our schools safer for all individuals.

School Athletics and Gender Diversity
Kristina Ferranto, Ava Saster, Emily Tavares, Caitlyn Brennan, Amanda Murphy
Faculty Advisor: Kirby L. Wycoff, Psy.D., NCSP

Our poster presents our goal of updating Massachusetts's educational policy to allow high school students who are transgender or questioning to play on the sports teams of the gender with which they identify. This project is related to an in-service learning opportunity in our undergraduate Educational Psychology course at Worcester State University. In a survey conducted by the National Gay and Lesbian Task Force, 71% of individuals who defined themselves as transgender or questioning hid their gender or gender transition to avoid discrimination (Chalabi, 2014). In order to prevent and redress the gender discrimination that occurs on high school sports teams, we have proposed modifications to current policies that promote gender diversity and the inclusion of all individuals.

Supporting LGBTQ Youth through Community Resources and Education
Kirianna Heisler, Kala Bishop, Alexandra Haggerty-Rahn, Courtney Pike, Kara Hussey
Faculty Advisor: Kirby L. Wycoff, Psy.D., NCSP

A survey done in Boston indicated that out of all LGBTQ youth in a nearby school, 30% were depressed and 21% considered self-harm to be a viable option. In comparison to heterosexual and cisgender students, who totaled 6% in both of these categories, these percentages are quite high (Almeida, et. al., 2009). This dilemma is not only occurring in our state, but in multiple schools across the nation. In order to reinforce a more accepting environment, we believe school communities need to participate in supportive educational programs. Our goal is to help schools bring in educated speakers, offer school psychologists who specialize in transitions, have more supportive guidelines in afterschool activities, and encourage the observation of important days in LGBTQ history and culture. Our poster explores how community resources and education can be used in school districts across Massachusetts to encourage diversity and support for all students, especially LGBTQ youth.

The Neuropsychology of Depression
Lauren Mello, M.Ed.
Faculty Advisor: Diane Tighe Cooke, Ph.D.

Depression is a feeling that many of us experience throughout our lives. However, for some individuals this can become more than just an occasional feeling, and many become consumed by it. Depression includes a variety of symptoms and different types, such as major depression, dysthymia, mood dysregulation, seasonal affective disorder, psychotic depression, and even bipolar disorder. The purpose of this poster is to examine the feelings the individual may be experiencing as well as what is happening to them neurologically. While there are many signs and symptoms that one can see with the naked eye, there are several chemical and neurological changes that are taking place within someone with depression. Signs/symptoms, detection, and intervention for depression will be addressed, as well as the environmental and biological factors that may influence it.

The Neuropsychology of Bipolar Disorder
Nicole C. Nowak
Faculty Advisor: Diane Tighe Cooke, Ph.D.

According to the National Institute of Mental Health, bipolar disorder causes unusual shifts in mood, energy, and activity levels in the brain, impacting one's ability to carry out everyday tasks. Mood shifts can range from the lows of depression to the highs of mania. The purpose of this poster presentation is to provide a comprehensive overview of the neuropsychology of bipolar disorder, including information relative to the environmental and genetic risk factors associated with bipolar disorder, research on differences in brain structure, and functioning associated with bipolar disorder. Additional topics discussed include the prevalence and causes of bipolar disorder, as well as the symptoms and characteristics displayed by individuals with bipolar disorder, co-morbid difficulties, assessments and diagnostic tools, and curriculum modifications. Classroom accommodations and treatment options are provided, as are resources for parents and educators.

Current Neuropsychology on Autism Spectrum Disorder
Amanda Polak, M.Ed.
Faculty Advisor: Diane Tighe Cooke, Ph.D.

Autism Spectrum Disorder (ASD) is an increasingly prevalent neurodevelopmental disorder. One in every 68 children is being diagnosed (CDC, 2014), yet the biological reasons for ASD remain unknown to researchers. However, recent studies have identified key areas of the brain associated with the disorder. This research has taken many years to collect, with more years of study required to provide concrete diagnostic criteria. The purpose of this presentation is to educate society on these common neurological areas associated with ASD and to demonstrate the impact ASD has on psychological functioning. Currently there are 7 identified areas of the brain that are correlated with ASD, all of which may be different in a case-by-case basis. This presentation also provides attendees with some of the common characteristics and risks associated with ASD that are determined by the typical diagnostic assessment process. Resources are also provided for those impacted by ASD and/or for those who would like to learn more.

The Role of School Psychologists in Ensuring Safe and Supportive Environments
Patrick Quinn, Alec Dorval, Kylie Dubey, Brittany Emond-Parkin, Natasha Gonzalez, Meghan Cleary-Magliaro
Faculty Advisor: Kirby L. Wycoff, Psy.D., NCSP

As the world becomes more connected through the evolution of technology, the psychological distress that today's youth experience is increasing at an exponential rate. With this increase in distress comes the greater need for a positive outlet and environment for students that are both safe and supportive. The introduction of the school psychologist role was the first step in creating this environment for students. According to the National Association of School Psychologists, the school psychologists-to-students ratio is 500–700 students (1:500-700), depending on the level of need within the student population ("NASP Practice Model," 2000). With this poster, we aim to identify the current scope of a school psychologist's role and responsibilities, ideas on how that role can be expanded in local schools to serve more student needs, and whether there is a need for more psychologists in schools to ensure that the demand is met successfully.

The Neuropsychology of Attention-Deficit/Hyperactivity Disorder
Victoria E. Sokoly
Faculty Advisor: Diane Tighe Cooke, Ph.D.

This poster presentation focuses on the neuropsychology of Attention-Deficit/Hyperactivity Disorder (ADHD), one of the most commonly diagnosed neurodevelopmental disorders in children. ADHD has been shown to have a large genetic component, as well as brain-based differences. Current research has also noted the neurotransmitter levels and brain structure abnormalities in those with ADHD. This poster also explores current diagnostic criteria, associated characteristics, medical information, common treatments, identification and assessment procedures, as well as legal and educational considerations. Further resources for ADHD are listed to aid families, educators, and those with attention difficulties.

Overcome Inertia, School Change: No Physics Required!
Victoria E. Sokoly, Amanda L. Polak
Faculty Advisor: Denise R. Foley

This poster was presented at the National Association of School Psychologists (NASP) 2015 Annual Convention. The study addresses the development, implementation and results of a single classroom-based pilot focusing on both reading and mathematics using an RTI model and its positive effects across a large, suburban elementary school in "stuck" in the individual student-focused "refer-test-place" paradigm. Only seventy percent of students met beginning and mid-year reading benchmarks and only fifty percent met mid-year math. All students met 2013-14 year-end reading benchmarks and eighty percent met math year-end benchmarks. School Psychology practicum students and site supervisor's initiative was combined with strong data to result in both funding commitment and program expansion for the 2014-15 academic year.

ENGLISH

Slavery and Antislavery, Then and Now: A Roundtable Discussion
Amy Angell, Katherine Bunker, Jason Grant, Katherine Lavoie, Brian Meagher
Faculty Advisor: Karen Woods Weierman, Ph.D.

In Fall 2014, the Transatlantic Antislavery Literature seminar (EN 450/998) traced the literary history of the antislavery movement in Great Britain and the United States. Students will briefly present their research findings and discuss how their perspectives have changed. The panel will then shift to a roundtable discussion and consider questions such as: What do we do with our new knowledge about slavery, past and present? How can we heal the wounds from the past and advocate for freedom in the present? Is there a moral argument for reparations? What exactly do we mean by "slavery" in the twenty-first century? Why is there so little public awareness that slavery still exists today? Might we learn from the antislavery campaigns of the past to promote public awareness and social change? Or does today's system of illegal slavery require new rhetorical strategies?

From Coconut Oil to My Own Healthy Eating Site
Kaitlin Boyle
Faculty Advisor: Barbara Zang, Ph.D.

Two of my biggest interests have always been creating and cooking. This intersection of my interests led me to create my final project for CM EN 270 Editing during the fall 2014 semester. I curated a WordPress website for coconut oil, which allowed me to learn new things and to show others what I learned. Coconut oil is an amazing ingredient both in and out of the kitchen and is slowly coming into the spotlight for all of the right reasons. I had already loved coconut oil before finding out more of its great internal and external benefits, which do amazing things for anything and anyone. I also love to help others, especially knowing that coconut oil can make a beneficial change in someone's life. Because of this, I recently created a website dedicated to healthy eating. My website KateEatsClean.com, launched just over a month ago, is attracting on average about 20 visitors a day so far.

The New Worcester Spy
Jennifer Johnson, Nicole Despotopulos, Brock Bowen, Alex McDougall, Madison Friend, Salvatore Tecci, Kate Tattan, Kristal McGovern, Noah Goldfarb, Jesenia Sanchez
Faculty Advisor: Hugh C. Wiese, Ph.D.

The New Worcester Spy is an online news and literary magazine edited by the students of Worcester State University. We provide readers with high-quality journalistic coverage of our campus community and the surrounding city, as well as a selection of fiction, poetry, personal essays, editorials, arts criticism, photographs, podcasts, and videos. This has been an exciting year for *The Spy:* we have increased our campus-focused news coverage and shortened our publication cycle, starting in the fall of 2014 with a bi-weekly schedule and in the spring to a weekly one. We have increased our social media presence and incorporated more multi-media content than ever before, and now feature podcasts and video content on a regular basis. Most importantly, we have continued our mission to publish a wide variety of high-quality, student-submitted content. Spy staff members will use our poster session to share their work, promote the publication, and recruit new Spy contributors.

HEALTH SCIENCES

Violence, Racial Profiling, and Community Police Tensions in Worcester, MA
Judeline Jeanbaptiste, Karena Nguyen
Faculty Advisors: Joyce Mandell, Ph.D., Michelle White, Ph.D.

In the wake of the fatal shooting of Michael Brown in Ferguson, MO and the chokehold death of Eric Garner in NYC, protests have erupted all over the country to call for an end to police brutality and unfair discriminatory treatment of people of color, especially young black men. Worcester has not been immune to the protests, allegations of police violence, and racially biased discrimination. This violence between the police and the community based on race has implications on public health. As a contribution to the larger public health policy in Worcester, our project is to complete preliminary research through community meetings, content analysis of local media coverage, and a literature review to understand the tensions and challenges between the police and communities of color.

HISTORY

Heartland Jingoism: How Nashville's Cultural Narrative Explains Post-Flood Media Coverage in May 2010
Kaitlyn Benoit
Faculty Advisor: Tona Hangen, Ph.D.

Sociologist Enrico L. Quarantelli wrote that much of what people know about a disaster, they learn from the media. Such was the case in May of 2010 when the Cumberland River in Tennessee rose to a crest of 51.9 feet, inundating the city of Nashville and its suburbs with extraordinary devastation. Homes, businesses, religious establishments, roadways, schools, and cultural institutions like the Grand Ole Opry were damaged and/or destroyed. During the first week post-flood, *The Tennessean* and local TV news stations devoted their media coverage to the disaster, but national news outlets arrived late to the scene and focused their attention almost exclusively on the flood's impact on country music institutions like the Grand Ole Opry music hall. This paper uses television and print news coverage, social media, and oral histories to tell the story of Tennessee's "thousand year flood" of 2010. It also examines the relationship between Nashville's cultural narrative and the history of the Grand Ole Opry, 21st-century media theory, and the concept of disaster framing in order to demonstrate why the media coverage of the flood made sense.

The Trouble With Hydrovite or Liberty's Balancing Act: Individualism versus Collectivism on the Moon
Oliver Hammerle
Faculty Advisor: Tona Hangen, Ph.D.

As a final project for Dr. Hangen's Spring 2014 seminar "History of American Thought", I wrote a science-fiction short story that broached a quintessentially American concept: the balance between individual liberty and the collective good. The opposing sides of the issue are presented in direct quotations from several historical figures. I will perform a live reading of my story and host a discussion of the work for audience members.

MATHEMATICS

The Takeover of Ebola: An SEIR Model Representation
Samantha D'Ascanio
Faculty Advisor: Maria Fung, Ph.D.

The United States of America is currently facing what could potentially result in a terrible Ebola epidemic. While most will agree that the issue at hand deserves our attention, we still do not have the proper medications and treatments to contain such a disease if it were to spread. In order to inform the public, epidemic models must be created to outline the potential spread rate of this deadly disease. This poster examines an approach to modeling the spread of the Ebola virus by using a SIR model for infectious disease. The poster will not only describe details on the Ebola virus and what an SIR model is, but also demonstrate potential outcomes using the SIR model and parameters determined by real-world situations.

Functions in the Complex Plane
George Gerges
Faculty Advisor: Maria Fung, Ph.D.

We consider the four basic functions on the complex plane:
e^z, cos(z), sin(z) and log(z), and describe how they differ from their real number counterparts.

Probabilistic Modeling with Discrete Systems
Sophie Gonet
Faculty Advisor: Susan L. Schmoyer, Ph.D.

We studied the long-term dining behavior of college students by looking at the flow of business from one dining hall to another. Models for this study were developed using proportionality and the Markov process, in which there are the same finite number of states or outcomes that can be occupied at any given time.

The Airplane Seating Problem
Sarah Grimes
Faculty Advisor: Susan L. Schmoyer, Ph.D.

We devised a plan for boarding different sized airplanes. Since an airplane only makes money while it is in motion, our goal was to minimize boarding and de-boarding times, so that a plane can make its maximum number of trips each day. We created procedures for a variety of airplane sizes, including small (85-210), mid-size (210-330), and large (220-800).

Fractals, Fibonacci, and Phi: Interesting Math from the Ancients to the Post-Modern Era
Oliver Hammerle
Faculty Advisor: Maria Fung, Ph.D.

Math-phobia and math-hatred—handicaps that many students experience—typically begin in school as a result of a lack of interest in math. Introducing topics such as fractal geometry at an early stage might maintain, or even generate interest in math. Fractals are inherently interesting: the infinite nature of mathematical fractals and the beauty of their graphical representations can appeal to people of all ages. Existing in the intersection of modern mathematics, technology, and natural processes, fractals have great potential to pique the interest of today's school kids. Rigorous study of fractals requires analysis and topology, but when given a primer on infinity, sequences, and the continuum, children and non-mathematicians alike can acquire a basic understanding of fractals. My project contrasts fractals with traditional "interesting math" constructs, the golden mean, and the Fibonacci sequence. Historical, pedagogical, and epistemological contexts are also considered, as well as a fractal created from golden sets.

First-Year Student Program Statistical Study
Marie Jezierski, Nicole Erickson
Faculty Advisor: Maria Fung, Ph.D.
A Commonwealth Honors Project

This research project was conducted in order to determine the effectiveness of an integrated learning community within a first year seminar, "Food in America", and an honors English course at Worcester State University. Results were collected through the use of AAU rubrics that were specially adapted in order to measure specific achievement levels in writing for first year college students. The study used statistical data based upon these results in order to make a conclusion as to whether or not this class is effective in improving communication literacy skills in first year students at the university.

Simulating Probabilistic Behavior with Roulette
Gina Molinari
Faculty Advisor: Susan L. Schmoyer, Ph.D.

Roulette is a game of chance in which players bet against the house on which compartment of a spinning wheel the ball stops in. The house has an advantage on any kind of bet, but numerous betting strategies have been developed over the years that claim to help the player beat the odds. We evaluate the best strategy for winning at roulette by looking at the player's profit after playing 1000 games and betting $1 on each game. Monte Carlo simulation allows us to model the probabilistic behavior of roulette and to test the various strategies under consideration. We see how each strategy affects the outcome, without losing any real money.

The Optimal Snowboarding Course
Adam Pepin, Wesley Hebert
Faculty Advisor: Susan L. Schmoyer, Ph.D.

We analyze properties of various snowboard courses to optimize certain aspects of doing tricks. For example, one might want to maximize the vertical height above the half pipe, or we could optimize for twists and flips while in the air. The practical formation of a snowboard course would be to optimize multiple aspects of snowboarding.

Computing in Mathematics
Rory Perkins
Faculty Advisor: Maria Fung, Ph.D.

Computer programming has had a great effect on mathematics. Many of the mathematics topics learned today in class would be far more complicated without the aid of computer programs. Using a programming language like Python, many mathematical problems can be very easily solved with the correct application of an algorithm-based program. This presentation will cover topics from number theory to how to program them, which includes division, prime numbers, greatest common divisors, factorization, and encryption. Measuring the amount of time it takes for a program to execute can be very informative when studying the speed of computing power and how long certain calculations take. The data collection shows proportionality between the number of iterations and their processing time, and the programs used in this study are examples of real world applications of number theory.

Using Graph Theory to Model Shortest Path
Courtney Pike
Faculty Advisor: Susan L. Schmoyer, Ph.D.

Consider a scenario where an inspector for National Grid needs to check all the streets in a region for damaged power lines. What is the minimum distance he must travel? In this poster presentation, we will answer this question using graph theory, discrete structures, and Eulerian circuits.

Unique Factorization Domains
Brittany Rivard
Faculty Advisor: Maria Fung, Ph.D.

Unique Factorization Domains (UFDs) have a direct correlation with the Fundamental Theorem of Arithmetic. Using Abstract Algebra, this Capstone project aims to explore UFDs in greater detail and show useful applications.

Deep Impact
Celine Tran, William Jackson, Evangelos Gatsios
Faculty Advisor: Susan L. Schmoyer, Ph.D.

Our goal is to predict the nature and scale of the disaster that an asteroid impact at the South Pole would pose to humans. Our focus will be to determine the probable amount and location of human casualties, to estimate the damage done to food production regions in the South Pacific, and to estimate the scale of coastal flooding as a result of ice melt. We compare the possible consequences of an impact in Antarctica with those of an impact elsewhere on the planet, and explore both the immediate and long-term effects of such an event.

A Mathematical Analysis of Rhinoceros Poaching
Kelsey Uppstrom, Ashton Payne
Faculty Advisor: Susan L. Schmoyer, Ph.D.

We made a model to demonstrate a harvesting policy – in this case, illegal poaching and in terms of population size of an animal species. We have chosen to study the rhinoceros and have created a predator-prey model for the rhinoceros in which the sole predators are humans. Through using a predator-prey model, we are determining if and when extinction will occur for these animals. Finally, we re-examine our model to discuss any variables that may have been excluded or held constant, and how these could further affect our modeling processes.

NURSING

Introduction to Hyperbaric Oxygen Therapy
Katelyn Adams, Amy Boucher
Faculty Advisor: Patricia Moran

The population of the wound clinic included diabetics, those with venous insufficiencies, lymphedema, and skin breakdown related to other causes. All clients had some degree of impaired physical mobility due to the location of their wounds. Most were English speaking, with three being primarily Spanish speaking, and the average age was 50 years old. Peripheral neuropathy was caused by uncontrolled diabetes, and the effects of hypertension altered clients' sensation in their lower extremities.

Exploration of Portraiture During Serious Illness and End of Life
Shelagh Amrich
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Death, loss, and grief are a shared human experience. Caring for loved ones at the end of their lives is associated with a wide spectrum of negative health outcomes ranging from depression, sleep disturbance, irritability, and upwards to major depression and complicated grief. This exhibit is the outcropping of an examination on how the photographic process may be used to reduce caregiver bereavement morbidity through pre-mortem conversations that seek to increase preparedness. Additionally, the creation of a transitional object—the portrait—may be of utility to caregivers via continued attachment theory. The photographic images displayed in this exhibition document the exploration of the talismanic properties of portraiture for end of life caregivers. The instillation is comprised of six photographs, each matted to approximately 11x14 inches.

Design of Educational Materials to Promote Prevention of a Sexually Transmitted Disease in High-Risk Populations
Megan Auchy, Hope Becker, Jennifer Cote, Kathleen Law, Megan Milliken, Kelly Tobin
Faculty Advisor: Ellen F. Fynan, Ph.D.
A Commonwealth Honors Project

As part of an Honors Program project in Medical Microbiology and in conjunction with the Greater Worcester Community Health Improvement Plan, materials were prepared to educate age 15 to 24 year-old individuals about the prevention of a sexually transmitted infection (STI). Our team focused on designing materials to promote the prevention of Human Papilloma Virus (HPV) infections. Materials highlight the important facts about the disease, including the causative agent, transmission, risk factors, disease symptoms, prevention, and treatment by using graphics and language appropriate for the target audience. In addition, we will present strategies that encourage safe sex practices in order to drive action on campus, as well as at local and state levels. This presentation will be judged against a competing team project that focused on the STI Herpes, mentored by Dr. Roger Greenwell. The winning team will receive a donation in their name to an infectious disease foundation of their choice.

Ebola Virus
Jonathan Bailey, Jennifer Cardinal, Emilie Cloutier, Meagan O'Brien, Meghan Pierce
Faculty Advisor: Patricia Moran

After evaluating the results from the initial Ebola presentation, there was a clear need to reduce fear and anxiety amongst health care workers and patients. Our plan for eradicating this fear is to educate the community and staff on current CDC guidelines and accurate Ebola information. This presentation is designed to be used in health-care settings, including both inpatient and outpatient, and has been adapted to allow for updates to be applied as evidence-based practice continues to change.

The Business of Health Care: Respect + Nursing Presence = Success
Kara Bandstra, MPH, RN, MSc
Faculty Advisors: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN, Gina Fleury, Lisa Gaudette, RN, M.Sc.

Health care today is often busy and rushed, with excessive costs and less than optimal patient outcomes. Many people see this as the business of, but like any business there is room for improvement, and nurses can play a big role in that improvement process. The key elements to achieving success in the business of health care include nurse presence, respect, and cultural awareness. Applying these key elements can improve patient outcomes and reduce costs, thus improving the business of health care. Educating both novice and expert nurses on the benefits of the "Art of Nursing" (nursing presence, respect, and cultural awareness) can change the perception of what the business of health care is.

Outreach Efforts to Decrease the Incidence of Sexually Transmitted Infections in Youth Populations of Central Massachusetts
Danielle Bavoux, Justine Butler, Madeline Killeen, Haley Melanson, Olivia Ripa
Faculty Advisor: Roger S. Greenwell, Ph.D.
A Commonwealth Honors Project

This Honors project is a joint venture between students enrolled in BI-206 Medical Microbiology and the Greater Worcester Community Health Improvement Plan (CHIP). The CHIP objectives in primary care & wellness are raising public awareness about teen and early adult sexual health, and decreasing the incidence of sexually transmitted infections (STI). This presentation is a culmination of our efforts to educate the public about the STI herpes, for which we have generated a range of materials for distribution to engage the public about this important disease. Our efforts will be judged as compared to a competing honors team project on Human Papilloma Virus (HPV), mentored by Dr. Ellen Fynan. The winning team will be given a donation in their name to a medically important foundation of their choice. Through our competition, the youth of Central Massachusetts will become better educated in safe sex practices and treatments for STI's.

Educating Senior Citizens on the Pneumoecoccal Vaccine
Rachel Cadorette, Kenny Corey, Nicole Hogan, Alyssa Jasper
Faculty Advisor: Patricia Moran

The CDC recommends that all adults over the age of 65 receive the Pneumococcal vaccine, specifically the PPSV23. It is highly recommended for adults over 65 who also have certain health conditions, weakened immune systems, and smokers. The Pneumococcal vaccine can prevent Pneumococcal disease and new guidelines for education were established. This project was carried out in collaboration with the Worcester Senior Center.

Music Therapy Within Assabet Valley Collaborative
Victoria Celia, Stephanie Martins, Meredith Nadolski, Jessica Saldana
Faculty Advisor: Patricia Moran

During our interaction with the student population of Assabet Valley Collaborative, it became increasingly apparent that music therapy was beneficial and enjoyable for all involved. We assessed that it was necessary to educate the parents and guardians of the students about the numerous benefits of incorporating music therapy into everyday home life. Using the Healthy People 2020 goals as a guideline, we were able to establish a list of objectives as well as short and long-term goals for educating parents and guardians. In accordance with these goals and objectives, we created an educational pamphlet regarding the benefits of music therapy and ways in which music therapy can be incorporated into home life that will be mailed to the homes of the students. This pamphlet will serve as a convenient tool for parents or guardians to reference as necessary during their daily routine and throughout their lives.

The Use of a Nontraditional Clinical Site to Teach Undergraduate Community/Public Health Nursing
William Chadbourne, MSNc
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

In today's competitive market for nursing school clinical sites, a paradigm shift in where students may go to learn skills may need to take place. With the public health sector slated to get more funding through the Patient Protection and Affordable Care Act of 2010, it is important that undergraduate students get exposure to a variety of populations. One way to do this is through the use of non-traditional sites such as churches, nonprofit agencies, and homeless shelters. This poster presentation highlights the experiences of Worcester State University undergraduate nursing students who utilized a community outreach center for Burmese refugees, and demonstrates how this non-traditional site has enhanced classroom learning.

Population Teaching Project: Antibiotic Noncompliance Among the Elderly
Joanna Christakis, Alyssa Heruckins, Stephanie Leger
Faculty Advisor: Patricia Moran

Noncompliance to antibiotic regimens is a relevant issue among the elderly at home. There appears to be a lack of education upon discharge from health care facilities and as a result, patients are not adhering to their regimen, as they do not know the importance of completing it. This lack of knowledge can lead to reinfections, readmissions to the hospital, and increased health care costs. In terms of admissions to care facilities, 10 percent of hospital admissions, and 23 percent of nursing home admissions, are related to the lack of medication compliance within the elderly population. This is costing the health care system in America approximately 100 billion dollars annually. If increased time, effort, and financial resources are put into providing education about antibiotic medication, the health care system could put the billions of dollars being used annually to use in a more beneficial way (Pasina, L.A., et al., 2014, p. 284).

Nursing and Process Redesign
Michael J. Dorval
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

There is a need in all health care delivery systems to improve patient outcomes, decrease costs, and perpetually improve efficiency. It is a universal principle that the farther away from the point of care a decision about delivering that care is made, there is an increase of higher risks and greater costs, and a decrease in sustainability. Quality improvement has recently been added to curriculum in nursing schools. However, the experienced nurse is expected to assist health care systems evolve into more effective organizations though they lack the understanding to achieve measurable improvements. Including the bedside nurse in process planning will ensure implementation of the change and improve outcomes and patient satisfaction, decrease risks and costs, and aid in educating bedside nurses in process redesign.

Music Therapy
Kaitlin Dryer, Steve Gebo, Mariah Scully, Sarah Wigley
Faculty Advisor: Patricia Moran

According to the American Music Therapy Association, music therapy is the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program. Music therapy is used within a therapeutic relationship to address physical, emotional, cognitive, and social needs of individuals.

Global Service Learning: El Salvador
El Salvador Nursing Group
Faculty Advisor: Maryann Sabetti-Gramajo

We will host a panel presentation of the Rural Health Care/Global Service Learning Program in El Salvador that we participated in from March 14th-21st. Students will make a short opening statement about their experiences in El Salvador and invite questions from the audience.

Emergency Preparedness in Quincy Public Schools
Christine Flynn, RN
Faculty Advisors: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN, Gina Fleury, Lisa Gaudette, RN, M.Sc.

The Quincy Public School (QPS) system staffs each school with registered nurses, which allows for onsite medical care during the school day. During off-hours when a nurse is not available there is a need for staff members to respond to medical situations, especially since many students have chronic illnesses such as asthma, diabetes, life-threatening allergies, and seizure disorders. My objective was to create Emergency "Quick Sheets" to educate non-medical personal on how to manage medical concerns when a nurse is not available. By interviewing school nurses and reviewing the School Nurse Software Program (SNAP), I was able to identify common medical concerns among school-aged children. The "Quick Sheets" illustrate how to properly react to medical situations and provide additional information to school staff members on how to react to medical emergencies when a school nurse is not available.

Building Healthy Communities One Workplace at a Time
Marilyn Gerrard, RN, MSNc
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Health promotion programs for employees offered at the workplace are effective in promoting healthy behaviors and improving overall health and well-being. Regular activity and application of stress reduction strategies improve health and quality of life. However, incorporating health activities to busy workdays can be challenging. Employees need support, and a school nurse is in a position to provide guidance to reduce stress, decrease weight, and increase physical activity. This poster describes the assessment, planning and implementation of a voluntary employee wellness program in a school setting. It also features the foundation and steps of the program's development as well as its highlights, a sample program, and recommendations for future programs.

Global Service Learning Improves Cultural Competence
Jessica Gervais, BSN, RN, MSNc
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

As our society becomes increasingly culturally diverse, the need to prepare nurses to become culturally competent practitioners has become more critical. Cultural competency is particularly relevant to nursing since nurses spend more time in direct patient care. Global service learning provides an excellent pedagogy for introducing nurses to patients of different cultural backgrounds, helping nurses become aware of the culture-related issues these patients face, and the health disparities in their communities when it comes to accessing health care. Nurses can then use this information to help teach culturally appropriate interventions to individuals and communities. A poster of a first-hand account of the influence of a service-learning trip to El Salvador will be displayed to show the growth of cultural competency for WSU nursing students.

Burmese Hand and Oral Hygiene Education
Jessica Gleba, Derek Holland, Shannon Lloyd, Jenna Schmidt
Faculty Advisor: Patricia Moran

After the Worcester Refugee Assistance Project population was assessed, the need for proper hand and oral hygiene became apparent. Each age group was faced with unique needs that were identified, including the understanding of how disease spreads, proper hand and oral hygiene, and proper preventative measures. The method used was a lesson plan that focused on hands-on demonstrations and the use of appropriate language for all age groups with the assistance of a translator. Planning for the presentation included identifying barriers specific to the Burmese population. Objectives were developed prior to the teaching including short-term and long-term goals. Evaluation of the teaching reflected meeting the short-term goals set at the beginning of the presentation. The presentation was documented in a way that can be replicated over time and the effectiveness of the presentation can then be subjected to a continuous evaluation.

Implementation of Health Literacy Practices in Designing a Program for Reduction in Hospital Readmissions from Door to Home
Marlene Goodale, BSN, RN, MSNc
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

The Central Mass Health Literacy Project (CMHLP)'s goal is to improve transitions from the hospital to home and reduce readmissions for high-risk patients. In collaboration with the Central Mass/MetroWest Transitions in Care Collaborative (CMTCC), the CMHLP designed and implemented a training program with graduate students from the Nursing Program of Worcester State University, utilizing plain language to help reduce hospital readmissions. 21 transition care coaches were trained to look for red flags associated with 13 medical conditions responsible for the high rates of hospital readmissions. Coaches met eligible Medicare patients in the hospital and followed them in the community for 30 days post discharge. In 2012, a partnership with Elder Services of Worcester resulted in CMTCC receiving an additional 2 years of funding from Medicare for their transition care program.

Physical Education Among the Burmese
Jesse Klayman, Katelyn Vitkos
Faculty Advisor: Patricia Moran

We worked with the Burmese community from Worcester Refugee Assistance Program (WRAP). These refugees originally fled Burma (Myanmar) due to the military attacking minority tribes who did not want to be unified with Burma. This caused them to flee to neighboring countries for fear of their lives and families. The community consisted of all ages, from infants to adults. Children of both sexes were in attendance, but the only adults were women. The youth of the community are all in school where they learn to speak, read, and write in English. It seems that the youth population has grasped the language without too much trouble. However, many high school students struggle to read and write at the level they should be at here in America. Many adults are taking English classes at WRAP (and are doing great), but are picking up the language at a much slower rate than their children. Through continued interaction with them, we learned that most of the adults went to school in Burma only until grade 2. After that, they started to stay home and help their families. Many of these adults and some children have no literacy in English, and most have no literacy of their own language.

Prescription Drug Overdose
Nelson K. Mayama
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

The prescription drug overdose (PDO) epidemic is an alarming public health problem in the United States that has been escalating for the past 20 years. In our nation more than 15 million people abuse prescription drugs, which is more than the combined number of cocaine, hallucinogens, inhalants and heroin-using populations. The CDC statistics demonstrate that overdoses are now the leading cause of accidental deaths, surpassing motor vehicle accidents. This poster presentation will define the public health problem, identify risks, protective factors, identify preventive strategies, and how to implement and ensure these recommendations nationwide. Government agencies, health care institutions, and community-based organizations are key in reducing the mortality rate caused by opiates. Clinicians and nurses who become familiarized with new clinical evidence-based practices and prescription drug monitoring programs (PDMP) will generate a positive outcome for the nation. These strategies aim to prevent and curb this public health crisis that is currently on our hands.

Preventing Falls Among Elders
Marissa Morassi, Amanda Caldarone, Kaitlyn Gilbert, Chelsea Fournier
Faculty Advisor: Patricia Moran

Falls are the most common accidents experienced by people over age 70, though the majority of falls that occur within this population are known to be preventable. The elder population is vulnerable to falls due to a decrease in their muscle strength, change in visual acuity, gait and balance issues, and hazards in the home or community. Exercise is one way to help increase muscle strength and agility, which in turn prevents future falls. This project was aimed at updating the Worcester Senior Center's over-50 exercise class to involve more interaction, upbeat music, new moves, and a better environment. The improvements are to promote and increase regular attendance in the class, which will increase participants' muscle strength, agility, and knowledge of fall prevention. A decrease in the rate of falls among elders will help lower potential complications that result from these accidents.

Population Teaching Project: Day Kimball Hospital Ebola Education
Kellie Pisa, Kathryn Harper, Ashley Tocci, Carmella Kurriss, April Travers, Chris Shohan
Faculty Advisor: Patricia Moran

One of the goals of Healthy People 2020 is to "reduce preventable infectious diseases" (Office of Disease Prevention and Health Promotion, 2014). Ebola is an infectious disease that can be contracted after close contact with an infected person. The Ebola epidemic in West Africa has recently been spotlighted in world news, and citizens of the United States are unsure how the virus might affect them or if they should be worried. In an attempt to reduce the spread of this disease, public health nurses can provide educational materials and programs to health care workers and other hospital staff on the subject of Ebola, as well as dispel fears related to contracting the disease. In keeping with the Healthy People 2020 goal of infectious disease prevention, our group of student nurses developed an educational poster on Ebola. This poster will be presented at an annual quality fair sponsored by the hospital in late October, and the target audience is all hospital employees (health care workers, office, maintenance, food service, and housekeeping staff included). Our diagnosis for this population is the risk for infection with Ebola virus related to knowledge deficit as demonstrated by verbal report of educational needs from the infection control nurse. Since the Centers for Disease Control and Prevention recently confirmed the first Ebola case in the United States, the fear and apprehension surrounding this fatal virus has increased significantly, and people are seeking answers to find out how they can protect themselves from the disease, especially health care workers who they interact with sick patients on a daily basis.

Pneumococcal Vaccine
Maggie Rizzo, Kerry Nelligan
Faculty Advisor: Patricia Moran

The elderly population is at great risk for acquiring illnesses due to their weakened immune systems. It is highly recommended that the elderly receive vaccinations for preventable illnesses. The pneumococcal vaccine can help protect against pneumococcal disease in the form of pneumonia (a lung infection), bacteremia (a blood infection), and meningitis (a brain infection). Patients who receive a pneumococcal vaccine are 40-70% less likely to die in a hospital from community-acquired pneumonia. Healthy People 2020 recommends increasing immunization rates and reducing preventable infectious disease. Our project's objective is to reduce invasive pneumococcal infections for children and adults <65 years of age.

Rhabdomyolysis in the Young Athlete: A Nursing Perspective
Stephanie Sech, BS, RN, MSNc
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Rhabdomyolysis is the destruction of myocytes that are released into the blood stream, thus causing a breakdown in muscle tissue and shifting energy production. Young athletes are at risk for many co-morbidities when exhibiting extreme muscle exertion (exercise) and/or muscular trauma. This type of muscle injury can be very harmful if untreated and should therefore be discussed as a potential reality for the athletic population. Many complications coincide with rhabdomyolysis; some occur immediately with an onset of symptoms and some occur later on. Unfortunately, rhabdomyolysis in young athletes is frequently unreported and is often undiagnosed. Communicating the importance of a strong knowledge base of rhabdomyolysis in young athletes, both at the high school and collegiate levels, is significant to proper muscular health maintenance. This poster identifies causes of rhabdomyolysis in the athletic setting, treatment and prevention, and education methods to promote awareness through a nursing perspective.

Reducing Elder Falls
Lindsey D. Silva, RN, MSNc
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

According to the Centers for Disease Control and Prevention (CDC), one out of three older adults falls each year, making falls the leading cause of both fatal and non-fatal injuries in the older adult community. To decrease this trend, the Worcester Division of Public Health is focused on reducing fall-related injuries among the elderly. The objective of this project was to assess the frequency, etiology, and outcomes of the falls of the elderly population in Worcester in order to provide appropriate recommendations to prevent further falls and improve risk assessment measures. Emergency call (911) data was obtained from the Worcester Police Department and entered into the Senior Support Team Database, where it was analyzed for prevalence and trends. The 70-84 year old age group represented the largest percentage of falls each year. Additional data results and recommendations for improving fall prevention efforts are illustrated in the poster.

Importance of Compliance in Hyperbaric Treatment Therapy
Camille Tercilla, Julie Russell
Faculty Advisor: Patricia Moran

Hyperbaric treatment therapy is provided to patients with wounds that are slow to heal, such as diabetic wounds, osteomyelitis, soft tissue or bone radionecrosis, compromised skin grafts and flaps, peripheral arterial insufficiency and ischemia, crush injuries, and gas gangrene. This treatment provides 100% oxygen and air pressure by increasing a patient's metabolic rate while allowing oxygenated blood to travel through the body providing infection control as well as growth factors (Hyperbaric Oxygen Therapy, 2014). Compliance with treatment is extremely important in this population's care.

Nhyira Ba: A Ghanaian Healthy Pregnancy Program "By the Community, for the Community!"
Grace C. Williams
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Worcester is reported to have the highest infant mortality rate (IMR) in Massachusetts. Ghanaians in Worcester constitute the highest African-born population, but this has gradually declined in recent years. Using an evidence-based participatory action research strategy to facilitate and promote a Healthy Pregnancy Program in the Ghanaian population in Worcester, MA, we used local knowledge - elders, community members, and businesses - to collaborate with university students and their faculty to identify culturally familiar ways to convey information about healthy pregnancies. In less than one year, Nhyira Ba – "Blessed Baby" – (a Worcester Healthy Baby Collaborative subgroup focusing on giving pregnant Ghanaian women medical and lifestyle information) has focused on activities in the Ghanaian community, including four videos scripted by community members in Twi (Ghanaian language) on healthy eating during pregnancy, culturally appropriate nutritional information, and promotion of websites and social media.

OCCUPATIONAL THERAPY

Music and Alzheimer's Disease
Madison Barron
Faculty Advisor: Latifeh Amini-Kormi., Ph.D.
A Commonwealth Honors Project

Alzheimer's disease is a complex deterioration of the nervous system that attacks the memory of those affected. Depending on the stage of the disease and the affected brain areas, patients may not remember who they are, and in some cases the vital visceral function(s) may be altered. Although many drugs and therapies have been tested, no cure has been found for this disease. However, music therapy is shown to have a positive impact on Alzheimer's patients. With its variety of genres, music allows Alzheimer's patients to recall their autobiographical memory.

Energy Conservation Techniques Prove Beneficial for Treating Individuals with Multiple Sclerosis
Jaclyn Becotte
Faculty Advisor: Latifeh Amini-Kormi., Ph.D.

Multiple Sclerosis (MS) is a chronic and progressive disease characterized by the inflammation of the central nervous system and axonal damage. With the onset of MS, the body's immune system begins to attack myelin and nerve fibers in the brain, spinal cord, and optic nerves. The purpose of this poster is to explore the factors that contribute to the development of the disease, the four unique courses of MS, and the variety of symptoms related to MS. Fatigue and fatigue management will also be highlighted in this presentation, as fatigue has debilitating effects on MS patients and needs to be treated accordingly.

Analysis of the Incidence and Causes of Falls in Worcester Area Nursing Home Residents and Identification of Possible Interventions to Reduce the Number of Falls
Faculty Advisor: Maureen Shamgochian

The objective of this research was to determine the effects of urinary tract infection (UTI), dehydration, pneumonia, psychoactive and cardiac or blood pressure medication, and the number and type of other comorbid conditions on the incidence and rate of falls in nursing home residents with and without dementia. A retrospective cohort study was designed using a survey to collect data in December of 2014 from nursing home medical records and fall incident reports. The setting was a nursing and rehabilitation center in Worcester, MA. Participants were forty-one nursing home residents with a history of falls. The results showed that the most common fall rate was 2 – 4 falls, 68% of nursing home residents had dementia, 90% had ≥ 5 comorbid conditions, 93% were prescribed with psychoactive medication, and 78% were taking cardiac or blood pressure medication. Additionally, 61% of residents had hypertension and 41.5% had a history of UTI. Nursing home residents with dementia had more comorbid conditions, and were more likely to experience multiple falls compared to residents without dementia. Conclusions show that dementia was independently associated with fall risk in nursing home residents. Multiple comorbid conditions, UTI, hypertension, and psychoactive and cardiac or blood pressure medication were all highly linked to falls. Nursing home residents with a history of falls, dementia, multiple comorbid conditions, UTI, or hypertension as well as those taking psychoactive, cardiac or blood pressure medication should be considered for certain fall-prevention strategies including vitamin D supplementation and multifaceted intervention.

The Role of Alternative Medicines and Activities in Multiple Sclerosis
Kelsey Miskis
Faculty Advisor: Latifeh Amini-Kormi., Ph.D.
A Commonwealth Honors Project

Multiple sclerosis is a disease of the central nervous system in which the body's immune system attacks the myelin sheath of the axons of neurons. Demyelination prevents the central nervous system from transmitting signals. Both genetic susceptibility and environmental factors could play a role in triggering the onset of the disease. So far, there are eleven FDA approved disease-modifying agents that are being used to slow down the symptoms of the disease. In addition, some patients use alternative medicines or alternative activities, such as yoga, to slow down their symptoms. The poster will focus on the role that these alternative medicines and activities have on the symptoms of multiple sclerosis.

Parkinson's Disease: A Degenerative but Manageable Disease
Janelle Platt
Faculty Advisor: Latifeh Amini-Kormi., Ph.D.

Parkinson's disease is a progressively degenerative neurological disorder that affects the control of body movements. Symptoms result from the deterioration of neuronal cells located in the substantia nigra of the brain, which causes a deficiency in the availability of dopamine. Although symptoms vary greatly between individuals, the typical symptoms used for diagnostic purposes are tremor, rigidity or stiffness, slowness of movement, and postural instability. At present, there is no known cause or pathological diagnosis. In order to treat Parkinson's, drug therapy is used to alleviate the symptoms through medications that help the brain produce dopamine. Other treatments include physical, occupational, and speech therapies. The focus of this poster is to highlight what exactly Parkinson's disease is and the many adaptations people have to face in order to live with the disease.

The Neuroscience Behind Depressive Disorders
Meghan Powers
Faculty Advisor: Latifeh Amini-Kormi., Ph.D.
A Commonwealth Honors Project
Depressive disorders are defined as a set of symptoms that cause a persistent feeling of sadness and irritability for a prolonged amount of time. Depression often causes people to lose interest in activities, develop unhealthy eating and sleeping patterns, and lose the ability to think or make decisions on their own. Research has shown that this disorder can be caused by deficiencies in the brain, such as imbalances of neurotransmitters, or an abnormal size of the hippocampus. Although it is the most diagnosed mental illness in America—20 million people each year with 15% of cases resulting in suicide – depression is still viewed as a weakness in our society. This presentation focuses on the characteristics of this illness and its forms, treatments, and the neurobiological reasons behind it.

PHILOSOPHY

The Necessity of Breaking Away from the Prison Industrial Complex
Victoria Maffeo, Carissa Rodriquez
Faculty Advisor: George N. Fourlas, Ph.D.

Our current system of dealing with crime, the prison industrial complex, is based largely around private, corporate interests. The corporations involved in mass incarceration profit from the systematic disadvantages of large populations, and therefore have no intention of rehabilitation. With this push towards incarceration, those who are not in elite positions in society are given few chances at repairing their lives, and thus the cycles of poverty and violence that their communities face are perpetuated. The prison industrial complex is not the answer to the persistent problems of poverty, drug addiction, and lack of education. The focus of this research project is to move away from this failed system and towards a more restorative approach to conflict that creates opportunities to address these issues, rather than inhibiting meaningful rehabilitation through violent domination.

Globalization: The Intent to Destroy
Tiara N. Yahnian
Faculty Advisor: Henry Theriault, Ph.D.

This project investigates the unconventional methodologies and mechanisms inherent in globalization, and aims to identify genocide as the essential strategy in the ambitious scheme: globalization. My argument is that globalists consent to genocide on the grounds that it is permissible so long as it stimulates economic and/or social progress.

PHYSICAL AND EARTH SCIENCES

Further Characterizing of Antarctica's McMurdo Dry Valley Microclimate Zones as a Function of Elevation and Aspect
Austin Canty
Faculty Advisor: Douglas Kowalewski, Ph.D.

The McMurdo Dry Valleys (MDV) of Antarctica are a hyper-arid, cold polar desert with an environment so unique, it may be the closest terrestrial analogue to Mars. The MDV have been subdivided into three microclimate zones based on summertime atmospheric temperature, positive degree-days, and geomorphic features. The three zones as described by Marchant and Head (2007) include the coastal thaw zone, an inland mixed zone, and an upland frozen zone. Slight variation in climate forcings may significantly influence the spatial distribution of morphologic features and active surface processes. Thus, defining the existing boundaries of the climate zones is important for assessing past and future climate change. We examine detailed spatial climate variability within the microclimatic zones, warranting further quantifying and sub-categorization of climate and landforms into localized nanoclimate zones. Through examining data collected from December of 2014 in Taylor Valley, this research aims to assess the differences in meteorological features between north and south-facing slopes in order to extend and update the current classification scheme used to describe processes that control climate within localized zones in the Dry Valleys.

Institutional Divestment from Fossil Fuels
Austin Canty
Faculty Advisor: Janelle Cornwell, Ph.D.

Divestment is the act of removing investments in a specific product, often for moral, ethical or financial purposes. In regards to university investment, the endowment fund represents assets that are donated to the university with the intention of investment so that the total asset value will yield a net profit for future investment and other expenditures, such as scholarships. These funds are often tied up in mutual funds that offer a diversified range of profitable investments. More often than not, these "profitable investments" include fossil fuel companies. Colleges and universities collectively have at least $12 billion worth of stock invested in this industry. The current global divestment campaign is centered on removing these companies from all university endowment funds. With this research, I aim to present the financial and moral necessity for education divestiture from the fossil fuel industry, offer insight of students' views on the investments that universities hold, and provide examples of other institutions that have successfully divested their portfolios.

Spatially Mapping Climate Zones in Antarctica's Dry Valleys and Managing Data through Relational Geodatabases
Austin Canty
Faculty Advisors: William J. Hansen, Ph.D., Douglas E. Kowalewski, Ph.D.

Climate in the Dry Valleys of Antarctica, a primarily ice-free region in the Transantarctic Mountains, varies with elevation and distance from the coast. Meteorological data has been continually collected in several locations in Antarctica's Dry Valleys for decades now. Much of this data is collected and available through the Long Term Ecological Research (LTER) network, but there are also several key meteorological stations maintained through the Boston University Antarctic Research Group. This project aims to compile this data, along with high-resolution imagery, in order to create a geodatabase that may be used in the future for further research purposes. Much of the data exists in varying locations and is not currently spatially referenced. LTER data consists of comma delineated data files with varying sensors such as atmospheric temperature, relative humidity, wind direction and speed, and solar insolation. A larger index file contains the latitude and longitude for each specific location. Compiling this data would require joining the data and adding it to a searchable relational database. The BUARG data consists of meteorological data collected mostly in Beacon Valley, ranging temporally from 2004 to the present day. This data would be compiled into a separate feature class within the geodatabase because it was collected and maintained by a different source. The data, along with ice core logs, field camp locations, excavation sites, and helicopter landing sites will all collectively make up the database that can be used for future data collection.

Comparative Limnology of Lakes Spanning the Boreal Forest-Tundra Transition Zone, Mealy Mountains, Labrador, Canada
Daniel Cronin
Faculty Advisor: Timothy L. Cook, Ph.D.

Lake sediments are an important source of paleoenvironmental information. The composition of lake sediment is governed by a variety of factors acting both within and outside of lakes. Understanding these factors is critical to interpreting long-term sedimentary records in terms of their environmental significance and for predicting how lakes will respond to future changes in climate. This study examines modern limnologic, morphometric, and watershed controls on the composition of lake sediments in a suite of lakes spanning the boreal forest and tundra biomes in the Mealy Mountains of southeastern Labrador, Canada (57.58 °N, 58.60 °W). Surface sediment samples were collected from nine lakes in combination with bathymetric and water quality measurements in July and August 2014. Sediment composition was evaluated by loss on ignition (LOI) and a geographic information system (GIS) was used to define watershed characteristics. Comparison of percent LOI values to lake and watershed characteristics suggests that lake depth is a primary control of lake temperature and dissolved oxygen content which in combination with watershed relief play a prominent role in determining the composition of lake sediments.

Land Use as a Tool for Identifying Water Quality in Massachusetts Watersheds
Sarah Firmani
Faculty Advisor: Timothy L. Cook, Ph.D.

This study investigates the relationship between human land use and the presence of eutrophication in Massachusetts lakes. Rising phosphorus and nitrogen levels in bodies of water have been increasingly attributed to human development and agricultural activity throughout watersheds. With the help of MassGIS, I began identifying land use and land cover parameters in order to determine the relative percent of various land use and land cover within a given watershed. These categories will be used to describe the watersheds of Massachusetts lakes as urban, suburban, agricultural-rural, or non-agricultural-rural. The lakes for this study were selected based on the sufficiency of their existing water quality data collections on nutrient loading and dissolved oxygen levels, in remotely identifying their eutrophic status. Ongoing work is expected to provide a means for predicting water quality based on surrounding land use patterns.

A Geospatial Relational Database Management System for Assisting Land Trust Managers
Jesse Gilchrist
Faculty Advisor: William J. Hansen, Ph.D.

Geographic Information Systems (GIS) offer land trust managers a tool for managing properties, enhancing public access, providing information to supporters and coordinating volunteer activities. Trail data, trail difficulty data, trail start-and-end data, parking area data, trail condition data, elevation data, and many other key parts of data would be needed to provide enough information. We are proposing a structured Geospatial Relational Database Management System (RDBMS) to facilitate the collection and analysis of trail and property data. This RDBMS will allow land trust managers to create new maps, coordinate trail maintenance, set availability of parking, map trails based on difficulty and elevation, make trails easier to navigate, and facilitate rescue operations.

The Effect of Climate on Water Storage in Two Reservoirs in Western Massachusetts
Benjamin Kowal
Faculty Advisor: Timothy L. Cook, Ph.D.

Climate change is expected to have a significant impact on global water supplies in the coming years. Many regions will likely experience water shortages which could be detrimental to humans. In Massachusetts, many towns rely on surface reservoirs for their municipal water supplies; therefore, it is necessary to understand how climate conditions affect water storage in lakes. In this study, we examined observational data from two reservoirs in Montague, Massachusetts – Lake Pleasant and Green Pond – in order to gain insight into the effect of local weather conditions on lake storage. Both of these lakes are utilized as emergency backup surface water supplies for the town of Turners Falls. Water level was monitored in both lakes from June 10 to November 24, 2014. Meteorological data including precipitation and air temperature were also gathered for the same period from local weather stations. Results revealed that Lake Pleasant experienced a slightly greater increase in storage capacity than Green Pond, which was expected considering its larger watershed. Additionally, the lakes appear to respond sensitively to daily inputs of precipitation as well as to seasonal changes. A water balance model is under development in order to evaluate the relative influence of changes in precipitation, evaporation, and groundwater exchange on water storage in these lakes. This model will be useful for predicting the impacts of future climate change on the availability of surface water.

Representing the Effect of Climate on Water Storage in Surface Reservoirs Using a Structured Spatial Geodatabase
Benjamin Kowal
Faculty Advisor: William J. Hansen, Ph.D.

Climate change is expected to have a significant impact on global water supplies in the coming years, and many regions will likely experience water shortages that could be detrimental to humans. In Massachusetts, many towns rely on surface reservoirs for their municipal water supplies, making it is necessary to understand how meteorological conditions affect water storage in lakes. In this study, observational data was collected from June 10-November 24, 2014 in two lakes in Montague, Massachusetts: Lake Pleasant and Green Pond. Results revealed that Lake Pleasant experienced a slightly greater increase in storage capacity than Green Pond, which was expected considering its larger watershed. Additionally, the lakes appear to respond sensitively to daily inputs of precipitation as well as to seasonal changes. I am proposing the development of a structured geodatabase that will organize the collected data that will be used to represent the area and the changes in water storage. This geodatabase will be useful for future studies examining the effects of climate change on surface water reservoirs.

Sustainability Survey
Nicole Michaud
Faculty Advisor: Timothy L. Cook, Ph.D.

In 2009, the Massachusetts Institute of Technology (MIT) set out to answer this question: how are sustainability pressures altering the competitive landscape, and how are businesses responding? MIT interviewed business leaders to discover what sustainability meant and how their businesses were addressing any issues. I tested the results of the MIT Sloan Management Review on business sustainability by collecting independent data from a survey that I created and comparing them against the Sloan Review. My hypothesis was that the participating businesses would develop increased consumer sustainability concerns and subsequently increase their sustainability measures.

Geospatial Relational Database of Quacumquasitt Pond, Brookfield, MA
Eric Moir
Faculty Advisor: William J. Hansen, Ph.D.

Quacumquasitt Pond water quality appears to be sensitive to changes in natural as well as anthropogenic forces and will be a prime area of study for future students. We are proposing a structured Geospatial Relational Database Management System (RDBMS) to facilitate the collection and analysis of data in order to assess these changes. GPS locations of current and future coring sites can be uploaded to the database and will be linked to the loss on ignition (LOI), magnetic susceptibility, gamma density, and radiometric dating data that each core will provide. With the completion of this database, a new student should be able to use it to locate future coring sites, keep track of previous core results, and upload new data from the newest selected sites.

Water Quality of Quacumquasitt Pond, Brookfield, MA
Eric Moir
Faculty Advisor: Timothy L. Cook, Ph.D.

In this study we use magnetic susceptibility, gamma density, loss on ignition (LOI), and relative dating techniques on a sediment core to identify changes in sediment delivery and water quality within Quacumquasitt Pond, Brookfield, MA. Sedimentological changes observed in the core are cross referenced with historical data to establish whether the changes in sedimentation and water quality are a product of natural forces (i.e. flooding) or are due to anthropogenic modifications to the outlet stream, which connects Quacumquasitt Pond to nearby Quabog Pond. LOI, magnetic susceptibility, and gamma density are used to determine the composition of the sediment and identify unique event deposits that are indicative of a flooding event. Preliminary results suggest that Quacumquasitt Pond is sensitive to both natural variations and recent human impacts. Ongoing efforts to constrain the chronology of the sedimentary record based on radiometric dating should help decipher the relative impacts of human versus natural perturbations to the lake over its history. The 1.85 m long sediment core collected from Quacumquasitt Pond will likely yield a record of water quality and past flooding events that spans the past 1,000 to 2,000 years.

A Paleolimnologic Perspective on Water Quality Degradation in a Rural Water Body: Lake Warner, Hadley, MA
Taylor Nelson
Faculty Advisor: Timothy L. Cook, Ph.D.

Declining water quality and cultural eutrophication are common problems affecting lakes, ponds, and reservoirs throughout the world. Many instances of declining water quality have been linked to excess inputs of nutrients; as such, effective lake management relies on an understanding of the sources of nutrient enrichment to the subject body of water. Lake Warner is a small (surface area 0.28 km2; max depth 3.0 m) reservoir that was created by damming of the Mill River in Hadley, Massachusetts. The lake is currently experiencing water quality issues marked by high turbidity and excessive growth of aquatic macrophytes. In order to evaluate potential causes of declining water quality and place modern conditions in a long-term context, this study examines sediment cores collected from Lake Warner in October 2014, where the age control for the cores is provided by Pb and Cs activity profiles. Sediment analyses are focused on examining changes in the composition and accumulation rate of sediment in the lake based on measurements of sediment bulk density and loss on ignition, along with indicators of sediment source (carbon and nitrogen isotopes) and primary productivity (diatom abundance and composition). Preliminary results indicate an abrupt change in sediment composition in the early to mid 20th century followed by a continued trend towards an increased percentage of organic matter preserved in lake sediments. The change in sediment composition appears to coincide with a shift in the assemblage of diatom species preserved in the core.

Worcester Commercial Nodes
Joseph Schlegel
Faculty Advisor: William J. Hansen, Ph.D.

Commercial nodes are areas within a city where large groups people interact. These are important economic spaces for cities, which are looking to expand in the future. The city of Worcester, Massachusetts has selected areas to become these central commercial nodes, where a focus can be placed on improving and developing portions of the city in order to facilitate economic growth. The purpose of this project is to create a geodatabase, which will organize and allow for future data to be added. With this database, information of future and present economic growth can be mapped to examine its success.

Recent Changes in Sub-glacial Discharge Characteristics of the Kongsvegen-Kronebreen Glacial Complex, Kongsfjorden, Svalbard
Dominique A. Seles
Faculty Advisors: Timothy L. Cook, Ph.D., Douglas E. Kowalewski, Ph.D

Evaluating glacial meltwater processes in areas that are sensitive to changes in climate, such as the High Arctic, establishes direct links between atmospheric and oceanographic trends and tidewater glacier responses. This study examines recent changes in subglacial discharge characteristics of the Kongsvegen and Kronebreen glaciers at the head of Kongsfjorden, Svalbard. Ice-proximal data assessing subglacial meltwater volumes and the characteristics of sediment entering Kongsfjorden determine the response of tidewater glaciers to climate change and their potential for future stability. We specifically look at the volume and rate of melt water and sediment entering Kongsfjorden via two main upwelling sites. The data used for analysis were collected within 2km of the ice margin during peak melt season, and were compared to similar data sets. Salinity (conductivity), Temperature, and Depth (CTD) profiles were collected in transects along the ice face and within the turbid upwelling plumes using both a Sea-Bird SBE 19 CTD Profiler and SAIV A/S CTD/STD model SD204, each with an attached optical backscatter (OBS) sensor to measure relative turbidity. Sediment samples were collected to study settling velocities, particle size distributions, and provenance. Sediment concentrations and current velocity measurements were also collected at different depths within the upwelling plumes to characterize the water column. Preliminary examinations of field observations indicate a shift in the dominant upwelling locations and greater variability in subglacial meltwater output. However, sediment volumes entering the fjord near Kongsvegen, where a new accumulation of sediment has aggraded above sea level, appear to remain high.

Women of Liberia: Public Perception vs. Personal Experience
Chelsea Smith
Faculty Advisor: Timothy L. Cook, Ph.D.

The civil wars in Liberia brought changes to women's political voices that have granted them more power, including the presidency. Political prominence has led to the conclusion that women are empowered; however this change in status is only apparent on the political level. Frequent instances of physical and sexual violence are reported across post war Liberia, indicating that political power has not translated into the daily lives of women. This study uses individual interviews conducted in spring 2015 to determine if war leads to an improved status for women or reasserts traditional gender roles.

New England is Trending Towards a Climate of Intensified Precipitation Events
Holly Tofani
Faculty Advisor: Timothy L. Cook, Ph.D.

The outcome of projected future climate change is an increase in the occurrence of extreme precipitation. New England has seen an increase in heavy precipitation of 2 inches or more within a 24-hour span. Past research has proven that climate change is a key factor for the increase of intensified precipitation. I am looking at daily precipitation data (past 100 years) from various climate stations scattered throughout Central New England that collected from the National Climatic Data Center. Comparing data from 1916-1945, 1926-1955, 1936-1965, 1946-1975, 1956-1985, 1966-1995,1976-2005, and 1986-2015, it is evident that there is an increase of intensified storms within the past 30 years. This shows that New England can expect storms with heavy precipitation of 2 inches or more within a 24-hour span to become a more common weather pattern. As a result, we may have to start preparing ourselves for even bigger 100-year storms than what we have already experienced.

PSYCHOLOGY

The Effect of Motion Dynamics on the Ebbinghaus Illusion and Corridor Illusion
Danielle Courtemanche, Ryan Mruczekm, Ph.D.
Faculty Advisor: Ryan Mruczek, Ph.D.

Visual illusions demonstrate that the brain must integrate multiple pieces of sensory information in order to construct an internal representation of an object's size. In the Ebbinghaus illusion, a circle surrounded by larger objects is perceived to be smaller than one surrounded by smaller objects. Previous research has shown that a dynamic version of this illusion, in which the objects are moving, results in a stronger illusion. We tested the effects of motion dynamics on the Corridor illusion, in which a circle that looks further away is perceived to be larger than one that looks closer. To measure illusory effects on perceived object size, participants adjusted the size of a growing circle in dynamic illusions so that the circle did not appear to change size over time. The results indicate that motion dynamics enhance the magnitude of the Ebbinghaus illusion and decrease the magnitude of the Corridor illusion.

Promoting Interest and Knowledge in College Students: The Interaction Between Learning Strategies and Task Application
Jennifer Jackson
Faculty Advisor: Colleen J. Sullivan, Ph.D.
A Commonwealth Honors Project

This 2x3 experimental research design focused on promoting interest and knowledge among Worcester State University undergraduate students through the use of learning strategies and application of a task. Three types of learning strategy categories were used: deep processing (elaboration), surfacing processing (rehearsal), and metacognitive processing (self-regulation). The combination of using a learning strategy and applying a task creates a unique interaction that identifies successful learning approaches, which benefit the classroom environment and stimulate academic success. I hypothesized that students who used deep processing or a metacognitive learning strategies and completed these tasks would have increased interest and knowledge compared to their counterparts who used a surface processing learning strategy and did not complete the task.

Climate of Change: Social Values, and Individual Beliefs and Behaviors
Alison Kahn, Champika K. Soysa, Ph.D.
Faculty Advisor: Champika K. Soysa, Ph.D.

We studied uniqueness (individualism) and harmony (collectivism) as predictors of both general and student behavior modifications in relation to climate change among 190 college students, along with their beliefs and concerns about climate change. Concerns about climate change and harmony predicted general behavior modification, and concerns alone predicted student behavior modifications. Our findings could inform efforts to increase environmentally conscious behaviors in college students. Poster accepted for presentation at the Eastern Psychological Association annual conference, Philadelphia, PA, March 2015.

Teaching Undergraduates about Mindfulness
Keith Lahikainen, Psy.D., Champika K. Soysa, Ph.D.

Research demonstrates that using mindfulness techniques with clients as well as in developing professional efficacy among students leads to positive outcomes. This article presents the results of a mindfulness teaching intervention by examining baseline and post-teaching impacts among undergraduate human service (N = 91) and psychology (N= 83) majors at two institutions. After being exposed to a teaching module on mindfulness, students at both institutions increased their ability to differentiate between the facets of mindfulness and increased their willingness to use mindfulness themselves and with future clients. The findings support the inclusion of mindfulness education in human services curricula. Published in the Journal of Human Services (October, 2014).

Great Expectations: Perfectionism and Residence Status Predict College Adjustment
Samuel Lapoint, Champika K. Soysa, Ph.D.
Faculty Advisor: Champika K. Soysa, Ph.D.

Researchers have established college adjustment as a predictor of student retention (Credé & Niehorster, 2012). Using a social-cognitive framework, we examined perfectionism and residence status as predictors of college adjustment among first-year undergraduates (N = 175) from a public university. In hierarchical regression analyses, dissatisfaction and high standards aspects of perfectionism predicted academic adjustment and institutional attachment. Dissatisfaction predicted social adjustment. Dissatisfaction, reactivity to mistakes, and black and white thinking predicted personal-emotional adjustment. In the second step, residence status added unique variance in predicting social adjustment and institutional attachment. This research advanced the literature because perfectionism and residence status have not been examined together in predicting college adjustment. These findings could improve academic success and retention efforts in universities. Psi Chi Journal of Psychological Research (2014), 19, 98-107.

Reducing Transphobia Through the Development of a Transgender Awareness Webinar
Geraldine Puerto, Heather Casey, Alyssa Herrick
Faculty Advisor: Lauren Mizock, Ph.D.

This present study involved the development, dissemination, and pre-post assessment of the effectiveness of the Transgender Awareness Webinar, with the goal being to educate participants about transgender individuals and lower transphobic attitudes. Participants included 303 undergraduates at a state university in the Northeastern U.S. Each participant completed electronic pre-test and post-test measures of the Transphobia Scale (Nagoshi et al., 2008) before and after participating in the webinar. The 30-minute webinar included Microsoft PowerPoint slides, images, charts, quiz questions, and video. Content included topics such as appropriate terminology, pronoun usage, qualities of respectful interaction, and the impact of transphobia. Five content experts in transgender research and services provided feedback and revision on initial drafts of the webinar, which was integrated from pilot tests by 4 undergraduates to enhance usability by the target participant group. Results indicated that the webinar significantly reduced transphobic attitudes according to pre-post test scores on the Tranpshobia Scale.

The Role Structure Plays in College Students' Recall and Metacomprehension
Mark S. Servello, Joey Stilwell
Faculty Advisor: Emily Soltano, Ph.D.

This study examined whether structure improved participants' recall of textbook information and whether there was a relationship between recall and metacomprehension. The results suggest that under these experimental conditions, structure was not a significant factor; however, the type of material (conceptual or factual) does influence recalling information. There was also a positive correlation between participants' recall and their metacomprehension. The results of this study may have implications for educators and students at all levels.

Facets of Mindfulness and Aspects of Serenity Predict Stress and Well-Being
Champika K. Soysa, Ph.D., Keith Lahikainen Psy.D., Robyn Lilly, Alison Kahn, David Erickson, Shaelah Farrell, Katelyn Dupont, Mallory Johnson, Marisa Molinaro, Agathe Cretzu

Researchers have not examined mindfulness and serenity as predictors of psychological outcomes in college students. We examined potential differences in mindfulness and well-being in a public university (n = 93) and private college (n = 158), as well as mindfulness and serenity as predictors of stress and well-being in undergraduates (N = 263). There were no differences in either mindfulness or serenity between students at the two institutions. Non-reacting and non-judging (mindfulness) and gladness (serenity) were the most consistent predictors of student stress (inversely) and well-being (positively). These findings may inform interventions to enhance well-being and decrease stress in undergraduates.
Perfectionistic Dissatisfaction and High Standards Mediate the LOC - College Adjustment Relationship
Champika K. Soysa, Ph.D., Samuel O. Lapoint, Alison Kahn, Carolyn Halfpenny, Kathryn Fant, Lori Dawson Ph.D.

We investigated dimensions of perfectionism (dissatisfaction and high standards) as mediators of the relationship between locus-of-control (LOC) and college adjustment in 176 primarily first-generation college students. Perfectionistic dissatisfaction mediated all relationships between two aspects of LOC (internality and powerful others) and four types

of college adjustment (academic, social, personal-emotional, and institutional attachment) and high standards mediated some of these relationships. Our results inform student retention efforts at colleges and universities. Poster presented at the Association for Psychological Science annual convention in San Francisco, CA, May 2014.

Mediating Perceived Parenting Styles—Test Anxiety Relationships: Academic Procrastination and Maladaptive Perfectionism
Champika K. Soysa, Ph.D., Andrea Weiss

We investigated perceived authoritarian and authoritative parenting styles in mothers and fathers, academic procrastination, maladaptive perfectionism, and both affective and cognitive test anxieties in 206 undergraduates. Supporting study hypotheses, academic procrastination and maladaptive perfectionism concurrently mediated the positive relationship between perceived authoritarian fathering and both affective and cognitive test anxieties, but only maladaptive perfectionism mediated the positive relationship between perceived authoritarian mothering and both affective and cognitive test anxieties. Conversely, supporting study hypotheses, academic procrastination and maladaptive perfectionism concurrently mediated the inverse relationship between perceived authoritative parenting (in mothers and fathers separately) and both affective and cognitive test anxieties. Our study added to the literature by establishing academic procrastination and maladaptive perfectionism as concurrent mediators in the relationships between perceived parenting styles and test anxiety, except for perceived authoritarian mothering. These findings could improve academic success and retention among vulnerable undergraduates. Published in Learning and Individual Differences (2014), 34, 77-85.

Academic Entitlement and Student Consumerism: An Analysis of the Relation to GPA and Motivation
Emily White, Jennifer Jackson
Faculty Advisor: Colleen J. Sullivan, Ph.D.

To be academically successful, students must take responsibility for their work. Academic entitlement is the expectation that students should receive positive feedback for work in the academic setting, regardless of the amount of effort put forth (Twenge, 2009). An increasing number of students feel entitled to a level of academic success in exchange for paying tuition. Student consumerism, which is the view that higher education is a commodity being financed rather than an investment in one's future, relates to academic entitlement (Fairchild, Crage, Pescosolido, & Martin, 2005). The results of the research study supported the hypotheses, and showed that externalized responsibility and GPA were negatively and significantly correlated. Academic entitlement and student consumerism related negatively to multiple adaptive forms of motivation (i.e., mastery-approach goals, task value, self-efficacy, control beliefs of learning), while positively relating to maladaptive forms of motivation (i.e. mastery avoidance, performance avoidance and test anxiety). Based on the study, academic entitlement beliefs may adversely affect a student's education.

SOCIOLOGY

Skateboarding, Do-It-Yourself Urbanism, and the Making of Neoliberal Public Spaces in Worcester, MA
Nicholas Beaudoin, Dannielle Morrow, Thomas Sedares
Faculty Advisor: Francisco Vivoni, Ph.D.

The current cycle of neoliberal governance regimes shapes city centers into highly prescribed loci of social interaction. Downtown Worcester is undergoing a round of revitalization set on transforming a rustbelt industrial core into a mixed-use playground for affluent city dwellers. Street vendors, panhandlers, graffiti artists, and skateboarders figure among a growing register of public space users that are excluded from fully participating in the neoliberal city. This presentation chronicles the making of new public spaces in Worcester by focusing on skateboarders as skillful practitioners of do-it-yourself (DIY) urbanism. It highlights key contradictions within contemporary city-making strategies via the experiences of skateboarding as an art, crime and sport. Through the dynamic prism of skateboarding as a meaningful social practice, this presentation heralds a vision of public space as a deeply contested terrain for both the regulation of out-of-place bodies and the embodiment of full democratic participation.

Wealth Inequality in the United States
Audra Brackett
Faculty Advisor: Sonya Conner, Ph.D.

This project seeks to change the conversation about wealth inequality in the United States. Wealth inequality has a causal effect on childhood poverty, which is linked to various related social problems in the United States. Using visual sociological methods, this project strives to act as a call to action to alleviate wealth inequality, and by extension, childhood poverty and related social problems.

URBAN STUDIES

HOT Team Works to Stop Alarming Drop in SNAP Caseloads
Danielle Albertson, Katie Cameron, Linda Carney, Kathleen Collins, Judy Knight, Nancy Leary, Maryellen Macuen, Sean Martin, Naomi Miller, Maria Navedo, Diane Parker, Joni Webster
Faculty Advisor: Maureen E. Power, Ph.D.

In the past 12 months, the Massachusetts SNAP caseload has declined by 7.7%, compared to the national average of 0.2%. SNAP (Supplemental Nutrition Assistance Program), formerly known as "food stamps", has helped millions of people put food on their tables. Radical changes within the Department of Transitional Assistance system, new MA EBT photo ID requirements, backlogged paperwork, and phone services have caused the drop. As a result, MA is losing over $12 million a month. HOT members guide people through the troubled DTA bureaucracy. The team, which is part of the Intergenerational Urban Institute in Urban Studies, maintains an office in Sullivan 129 and offers confidential application information and assistance to WSU students. HOT also connects with elders in the community by educating them through a SNAP Bingo game and providing application assistance. The HOT team is now part of a statewide advocacy network organized by MA Law Reform Institute.

America's Future Pastime? Street Skateboarding, Skateparks, and Social Control
Nicholas Beaudoin
Faculty Advisor: Thomas E. Conroy, Ph.D.

A skatepark is a recently developed concept of leisure space. Skateparks provide their own unique challenges to their users due to its unorganized form of play and the absence of a traditional model of design, unlike organized sports such as basketball or baseball. Although the presence of skateparks can be viewed as a gain for many communities, they represent conformity, control, and the criminalization of popular forms of street skateboarding to many young skateboarders. An ongoing element in the historical development of America's parks has been the control imposed on youth as well as the criminalization of certain forms of use and behavior in public spaces. This paper will analyze the implications of social control in the development of America's parks and what has led to the current resistance from the street skateboarding communities to the development of skateparks.

Translating Life Experience, Building Life Skills: The English Language Learners Program
Madeline Otis Campbell, Ph.D., Tom Savini, Jean Abdella, Sarah Lyons

The English Language Learners program, sponsored by the Intergenerational Urban Institute and the Department of Urban Studies, facilitates relationships among Worcester State students and diverse refugee and immigrant populations in the community. This 1-credit practicum is an experiential learning course, which provides students with the opportunity to teach conversational English, work with community-members preparing for citizenship, and assist newcomers to Worcester in translating their life experiences into everyday skills to navigate the city. In the process, an intercultural exchange occurs as Worcester State students and language learners share their stories and perspectives. Students tutor community-members from Iraq, Lebanon, Syria, China, Vietnam, Colombia, Puerto Rico, Albania and Russia, filling a need in the community and receiving a unique, personal and global outlook. This poster will highlight the work of the ELL program, identifying the student and community outcomes achieved.

Pathways to Higher Education: A Study of the Latino Opportunity Gap in Five Massachusetts Cities
Thomas E. Conroy, Ph.D., Mary Jo Marion, Timothy E. Murphy, Ph.D.

Presenting the results of a year-long funded study, this project takes a qualitative look at the opportunity gap for Latino young men in Boston, Worcester, Springfield, Lawrence, and Holyoke. The study begins to unravel the complicated forces that affect their decision-making process about family, education, work, and pursuing college diplomas in the Commonwealth.

Destination Cemetery: Land Use and the Competition Over Urban Space
Joseph Schlegel
Faculty Advisor: Thomas E. Conroy, Ph.D.

In New England, cemeteries have been historically used as sacred burial places. Initially located on the outskirts of settlements, cemeteries tended to be sited out of the city centers. As cities expanded, populations filled in the land around these cemeteries, and new ones were created, again on the fringe spaces. But this process left large unimproved tracts of land in densely populated core areas. Today these large areas are being transformed from places of mourning and burial to multi-functional spaces that serve recreational needs, provide aesthetic appeal, maintain historical usage and architecture, and protect vegetation and wildlife. As the world population keeps increasing and space dedicated for burial becomes limited, forward-looking urban areas are exploring alternative ways of burial to alter traditional patterns of land use. This project will explore how modern cites attend to cemetery burials in innovative ways. It will also include ideas, methods, and comparisons to other cities and cultures around the world.

VISUAL AND PERFORMING ARTS

Student Thesis Exhibition
Nicole Atchue, Nicole Elias, Isaac Fontaine, Aynsley Goodness, Brianna Howe, Kristine MacBrian, Shannon McGinty, Abigail Paley, Frank Quartarone, Justin Sliwoski
Faculty Advisors: Susan Fisher, Michael Hachey, Sam O'Connell, Ph.D., Stacey Parker, Amaryllis Siniossoglou, Catherine Wilcox-Titus, Ph.D.

The Student Thesis Exhibition marks the culmination of work by our graduating visual art students. Their work demonstrates their mastery of conceptual, technical, and aesthetic content as well as their impressive talent. Nicole Atchue focused on floral and natural forms as her inspiration; Nicole Elias produced ceramic sculptures that explore the female body as vessel; Isaac Fontain's gouache paintings used the high- energy colors and exuberant forms of animation; Aynsley Goodness made a conceptual installation about children and violence; Brianna Howe used mixed media to represent her complex attitudes toward mothers and heroines; Kristine MacBrian used photography and mixed media to explore gender as performance; Shannon McGinty used mixed media and printmaking to represent aspects of her own identity; Abigail Paley created a mixed media installation about consumerism and waste; Frank Quaratone designed a magazine entitled Buy American using computer-manipulated imagery; Justin Sliwoski used the self-portrait to explore alternative perceptions of reality.

Break the Silence with Their Words: Confronting Domestic Violence with Performing Arts
Maria Rose
Faculty Advisors: Lisa Kramer, Ph.D., Sam O'Connell, Ph.D.
A Commonwealth Honors Project

Teen dating violence has reached epidemic proportions in the United States. In the past year, approximately 1.5 million high school girls and boys reported being physically assaulted by their partner. It is my passion to help curve the cycle of domestic violence, and youth are the key to fixing this dilemma. One way of engaging young people to confront this issue is through Safe Dates, a dating violence prevention program. A key outcome of this workshop is the recognition of abusive behavior and warning signs of unhealthy relationships. Through the inspiration of service learning, participants will be challenged to use music, theatre and spoken word to confront these issues. The workshop will demonstrate the effectiveness of using performing arts to empower youth to break the silence with their words.

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