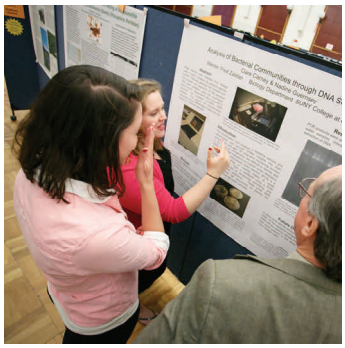
srca 2014

Student Research & Creative Activity Day

WEDNESDAY, MARCH 26
HUNT UNION BALLROOM



SUNY ONEONTA

2014 Student Research & Creative Activity Day

March 26, 2014
10:00 AM – 4:00 PM
Hunt College Union

Sponsored by:

College at Oneonta Foundation, Inc.
Division of College Advancement
Grants Development Office
Office of Alumni Affairs
Division of Academic Affairs

2013/14 College Senate Committee on Research

Thomas Beal (History)
Kelly Gallagher, Chair (Chemistry & Biochemistry)
Melissa Godek (Earth & Atmospheric Sciences)
Mette Harder (History)
Toke Knudsen (Mathematics, Computer Science & Statistics)
Kathy Meeker, *ex officio* (Grants Development Office)

http://www.oneonta.edu/a/srd/

srca Student Research & Creative Activity Day 2014

PROGRAM

10:00 AM – 12:00 PM

Viewing of student posters, computer displays and other exhibits spotlighting student scholarship and creative activity

12:00 PM – 1:00 PM

Luncheon and Keynote Address

Chuck Bogosta '80

Executive VP, University of Pittsburgh Medical Center (UPMC)
President, UPMC International and Commercial Services Division
President, UPMC CancerCenter

"From Oneonta to Kazakhstan" – Working in a Global Organization

As Executive Vice President of University of Pittsburgh Medical Center (UPMC) and President of UPMC's International and Commercial Services Division, Mr. Bogosta oversees international and commercial business efforts. This includes a leading transplant hospital and a new biomedical research center in Italy; a private hospital and cancer treatment centers in Ireland; a transplant center in Singapore; a comprehensive cancer center in Kazakhstan; a reference laboratory in India; and second-opinion pathology services in China. He also oversees UPMC's Advisory Services group, which advises governments and large healthcare organizations on the development of oncology, pediatric, telemedicine and information technology initiatives. Mr. Bogosta is also president of UPMC CancerCenter, which has the largest presence worldwide of any of the National Cancer Institute's Designated Comprehensive Cancer Centers. In this role, Mr. Bogosta is responsible for the strategic, operational and financial activities of all cancer-related clinical activities domestically and abroad. He holds a BS degree in Business Economics from SUNY Oneonta and an MA degree in Educational Administration from Bowling Green State University.

1:00 PM – 4:00 PM: *Viewing of student exhibits continues*

2:00 PM: *CSSR Student Paper Awards*

As part of its fourth annual student paper competition, the Center for Social Science Research (CSSR) will recognize two students for their award-winning papers on the theme of "Sustainability: Building Communities that Last." The winning papers will be edited and published on the CSSR website.

SUNY Oneonta

2014 Student Research & Creative Activity Day

STUDENT PARTICIPANTS

FACULTY SPONSORS

PRESENTATION SUMMARIES

Students: Sam Afriyie, Denis Muganza

Faculty Sponsor: Betty Wambui (Africana & Latino Studies / Women's & Gender Studies)

Transparency in African Leadership

In our presentation, we will discuss what it means for a leader to be transparent and accountable. We will use case studies in Africa as well as brief examples from the rest of the world to explain cases where transparency and accountability have and have not been fulfilled. From there, we will use the evaluations we found from both positive and negative cases and we will suggest prescriptions that could be followed for a bright future in Africa. We will focus on various leaders across the African continent such as Kwame Nkrumah, Nelson Mandela, Paul Kagame and Robert Mugabe. We will also evaluate these leaders for cases of fairness or bias.

Student: Angelica Aldana

Faculty Sponsor: Philip Sirianni (Economics, Finance & Accounting)

The Effects of Immigration on Wages from 2000 to 2010

This research paper focuses on what the effect of immigration is to people born in the United States, focusing on a comparison of the years 2000 and 2010. In order to find these effects I will be calculating the elasticity of substitution between different education and experience groups. This paper is modeled after the paper "Rethinking the Effects of Immigration on Wages" by Gianmarco Ottaviano and Giovanni Peri. In this paper the calculations prove that immigrants are imperfect substitutes for native born workers and they, therefore, find low effects of immigration on wages. My hypothesis is that I will also find that, in the years 2000 through 2010, immigrants and native born workers are imperfect substitutes; this will cause a rise in immigration to have small positive effects on the wages of native born workers and a large negative effect on the wages of current immigrant workers. In order to obtain to these results I am using data from the Census and from the American Community Survey.

Students: Angelica Aldana, Michael Coleman, Christopher Rollo, Ariel Rosero

Faculty Sponsor: Qun Wu (Economics, Finance & Accounting)

A Home-made Fund of Funds

In this research project, we build a home-made fund of funds. In our home-made fund, 23 mutual funds are on the current list of portfolio holdings of the College at Oneonta Foundation. The analysis is done using multiple ratios, VaR (value at risk), scenario analysis, and optimization. The purpose is to give an overview of the home-made fund performance and how to adjust the asset allocation to improve returns under different assumptions and potential situations.

Students: Kaitlyn Alongi, Tegan Mansouri, Erika Vorstadt, Melissa Caiola

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Acceptability of Chia Seeds as a Fat Replacer in Blondie Brownies

The average American consumes saturated and trans fats on a daily basis. These fats, contained in a majority of popular desserts, are proven to be one of the major causes behind the obesity epidemic in our nation. More than one third of adults in the United States are obese. Developing alternative recipes without these fats is a process of trial and error. Blondies are high in saturated and trans fat; therefore, finding an alternative recipe that reduces the fat would be beneficial for maintaining a healthy weight. In this experiment the fat (butter) will be replaced by chia seeds (at different levels: 0%, 50%, 75%, and 100%).

Student: Debora Assis

Faculty Sponsor: Toke Knudsen (Mathematics, Computer Science & Statistics)

American Mathematics Textbooks

The purpose of this study is to make the student body and faculty aware of the collection of American mathematic textbooks in the Alden Room of the Milne Library. There are over 220 books that were published between the years of the 1780s and 1980s. This collection of books includes the subjects of Algebra, Probabilities, Geometry, Elementary mathematics, Arithmetic, and several more. The three subjects that carry the greatest selection of books are Algebra, Geometry and Arithmetic. The largest selection of books are from the years between 1830-1880, with the subject of Arithmetic carrying about 85 books out of the 222 books. As part of the study, an exhibition of the textbooks at Milne Library will be displayed. About 4-5 books will be selected from four subjects to be displayed in a window case. Each of the 4-5 books will be selected from different time periods, which allows the viewer to recognize how the books of the same subject have developed over time.

Students: Maureen Auricchio, Nicole Leote, Tori Keegan, Julia Villani

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Substituting Butter in Sugar Cookies with Cannellini Beans

Different samples of sugar cookies were created with different ratios of cannellini beans replacing butter in order to determine an acceptable outcome of a healthier, lower fat cookie. The samples consisted of a control group made only with butter, a ratio of 50% bean to 50% butter, a ratio of 75% bean to 25% butter and a sample with 100% bean. Each sample was evaluated for taste, texture, color, mouthfeel and overall acceptability on a scale from 1-5 (1 being strongly disagree and 5 being strongly agree). Aside from the control group, both the cookies with 50% beans and butter, and 75% bean and 25% butter, would produce outcomes acceptable for consumption.

Students: Carter L. Bailey, Tyler Bianchine, Austin Borden, Deanna Caracciolo, Matthew Dami, Erica Darpino, Alayna Fuess, Benjamin German, Kaylee Herzog, Derek Johnson, Daniel Kopec, Alexander Lawrence, Jason Luce, Myles Moore, Lisa Newton, Shannon O'Neill, Shane Pickering, Rebecca Russell, Joseph Spaulding, Steve Stowell, Caitlin Stroosnyder, Clara Tanner, Christopher Teter, Jennifer Vanassche, Annie Yoo, Owen Zaengle

Faculty Sponsors: Willard Harman (Biological Field Station), Florian Reyda, Leslie Hasbargen, Sean Robinson, David Wong, Kiyoko Yokota (Biology)

2013 Student Facilitated Research at the Biological Field Station

More than 30 students directly participated in research activities at the Biological Field Station (BFS) in Cooperstown in 2013. Ten undergraduate and two high school students held summer research internships, during which they conducted field and lab research in applied aquatic ecology, wetland ecology, parasitology, wastewater treatment, and other environmental/field biology disciplines. Four students were hired as summer research assistants by faculty to conduct research in parasitology and geochemistry. Students involved as BFS research interns and student research assistants contributed technical reports of their projects to the BFS Annual Report, which is made available online and in hardcopy each spring. Graduate students also conducted research at the BFS in 2013, including 8 students in the MS in Lake Management Program and two students in the MS in Biology program.

Student: Carter L. Bailey

Faculty Sponsor: Willard Harman (Biological Field Station)

Canadarago Lake Watershed Protection Plan: Working Together for a Common Goal

Canadarago Lake is the focus of a great effort that will climax in the drafting of a comprehensive lake and watershed management plan. This plan will serve as a long-term management tool and a vessel for obtaining lake watershed improvement grants. I have been closely working with the community surrounding Canadarago Lake to establish the Canadarago Lake Watershed Partnership, consisting of representatives from each of the five local municipal governments (Towns of Richfield, Springfield, Otsego, Exeter and Columbia, and the Village of Richfield Springs), local conservation groups

(Otsego and Herkimer County Soil and Water Conservation Districts, SUNY Oneonta Biological Field Station, and Otsego Land Trust), and local stakeholders. As coordinator of the partnership, I arrange monthly topic-based public meetings, consisting of educational secessions followed by open community discussion. This partnership has enabled us to pool our resources and come together as a community to structure a bottom-up management plan for a local keystone natural resource. Following upgrades to the Village of Richfield Springs wastewater treatment plant in 1973, the New York State high phosphate detergent ban in the same year, and overall reductions in watershed nutrient loading between 1970 and 2010, water quality within Canadarago Lake is on the upswing. This partnership is working together to help facilitate and continue these types of efforts within the watershed to maximize future increases in overall lake health.

Student: Anthony Baum

Faculty Sponsor: Melissa Godek (Earth & Atmospheric Sciences)

Assessing the Links Between Synoptic Scale North America Weather and the Formation of North Atlantic Windstorms

Each year, dozens of fatalities occur when intense North Atlantic windstorms impact Western Europe during the winter months. Forecasting these storms in the short term is often problematic, but long term forecasts provide an even greater challenge. The majority of windstorms that reach Europe have origins as developing low pressure systems over the North American continent. This project aims to identify a particular source region in North America that ultimately produces a significantly greater number of dangerous storms. By analyzing past surface pressure maps, the tracks of storms that reach a central pressure of less than 965hPa at any point in their life cycle are recorded on maps encompassing North America and North Atlantic region. The resulting "spaghetti plots" show the source region and dissipation region of every storm, creating a climatology of severe North Atlantic windstorms. With such data, systems forming in regions known to be prevalent producers of severe windstorms can be identified and noted as potential hazards, many days before they will impact European communities.

Student: Megan Behzadi

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Acceptability of Pumpkin Puree as a Fat Replacement in Brownies

Dietary fat is important for maintaining healthy cell membranes, sustaining brain function, preventing cellular gluconeogenesis and body insulation. However, overconsumption of fat can lead to increased susceptibility of diseases such as obesity, high cholesterol, and precursors to atherosclerosis and heart disease. The purpose of this study is to examine the effect of pumpkin puree as a fat replacement in a standard brownie recipe. In addition to one control recipe, pumpkin puree replaced butter in a 1:1 ratio for brownie batches containing 50%, 75%, and 100% fat replacements. The brownie batters were made under identical conditions by melting butter or warming pumpkin puree followed by the addition of other ingredients to create the batter; and they were cooked in the same oven at 350°F for 25 minutes. The finished products were cooled and divided into 30 samples and presented to participants in a blind taste test. Participants evaluated brownies on overall acceptability, taste, texture, and appearance via a short survey. The brownie with 50% of the fat source replaced with pumpkin puree had the highest acceptability of the four batches and closely resembled the control batch, only falling short with mouth feel. This brownie had a caloric reduction of 17% via nutrient analysis. In summary, this study demonstrates that reducing the fat content of brownies by half produces a desirable brownie product.

Student: Anthony Beyers

Faculty Sponsor: John Relethford

Paleoenvironmental Influences During the Plio-Pleistocene and the Rise of the Genus Homo

My research focuses on the different hominin genus and species in Africa to determine possible links between climate change and human evolution. The research methods to analyze evolution in both South and East African hominin sites utilizes paleoenvironmental data to conclude if South or East

African climates were changing at relatively similar paces, where the genus Homo was developing. This data is also used to determine if one site over another had more conducive conditions in which hominins could develop, if there were any differences between these climate conditions, and, if so, what late australopith traits correspond to the evolution of Homo erectus, which many say is our definitive ancestor. The rise of the genus Homo can be seen roughly around 2.6–2 million years ago (Ma) and the paleoenvironmental data that will be discussed will cover the Plio-Pleistocene time frame, but mainly focuses on 2.6-1.2 Ma. This is the possible time period for our evolution from Australopithecus to Homo. It will be noted if similar climate fluctuations coincide with hominin evolution from previous genus and species, such as Sahelanthropus tchadensis (7-6 Ma), and continue through to Australopithecus afarensis (3.85-2.95 Ma).

Student: Shannen Bolde

Faculty Sponsors: Kelly Gallagher (Chemistry & Biochemistry), Nancy Bachman (Biology)

Cloning of C-Terminal Domain of CGI-112 Protein Involved in the ER-Associated Degradation Pathway

Comparative gene identification isolate 112 (CGI-112) is a human gene product that has recently been identified as a component of the endoplasmic reticulum-associated protein degradation (ERAD) pathway, which serves as a "quality control" mechanism for proteins destined for secretion outside of the cell. If a secretory protein fails to adopt the correct functional structure, molecules of the ERAD network will direct the misfolded protein to the proteasome, where it is broken down. Through homology modeling, a theoretical model of CGI-112 now exists. The model indicates a two domain structure for CGI-112, but a single domain for COX4N, a related protein. The goal of this research is to create a genetic construct for producing the C-terminal domain of CGI-112, which is not present in COX4N. Motivation for making the construct is two-fold: (1) to produce material that can be used to determine the structure of the C-terminal domain by NMR, (2) to create an antigen that will produce antibodies that bind to CGI-112 but not COX4N, therefore distinguishing between the two proteins.

Student: Austin Borden

Faculty Sponsor: Florian Reyda (Biology & Biological Field Station)

A Survey of the Genus *Spinitectus* (Nematoda) of Otsego Lake, New York

Since 2008, Otsego Lake has been intensely surveyed for species of parasites that infect the various fish species located in the lake. The lake has a range of different parasitic groups within these fish. One group is the genus of nematodes, *Spinitectus*. Initial survey work on this lake indicated three species of *Spinitectus* present in fishes; however, a potential fourth species has been discovered and it may be new to science. All the species used in this project were collected from a partial necropsy of several fish species. These include *Spinitectus gracilis* in *Ampbloplites rupestris*, *Micropterus dolomieu*, and *Lepomis auritus*, *Spinitectus carolini* in *M. dolomieu* and *A. rupestris*, *Spinitectus micracanthus* in *Lepomis macrochirus*, *Lepomis gibbosus*, *L. auritus*, *A. rupestris*, *Perca flavescens*, and *M. dolomieu*, and *Spinitectus* sp.in *L. auritus*, and *L. gibbosus*. The most recent descriptions of the three confirmed species of *Spinitectus* are approximately forty years old, and lack concise details of certain morphological structures, such as quantitative measurements of spine length. The goal of this project is to describe, or re-describe the species of *Spinitectus* found on Otsego Lake through the use of light microcopy, scanning election microscopy, and collaboration with a known expert of nematodes.

Students: Erika Bornhoft, Maria Keable, Jaclyn Penney, Charles Remillard, Kyle Wright, Lauren Zeoli

Faculty Sponsors: Paul Bischoff (Secondary Education), Paul French (Physics & Astronomy), John Schaumloffel (Chemistry & Biochemistry)

Location, Location? The Decision-making Effects of High-need New York City Teaching Placements on the Career Pathways of Noyce Scholar in Science Teachers

Funded by NSF in 2009 via a $900,000 grant, the main goal of the Noyce Scholars Program is to prepare Science Education majors with the pedagogical-content knowledge and cultural awareness

skill sets that will enable them to become effective teachers in high need schools. In this study Noyce Scholars reviewed their personal data (five years of longitudinal reflective essays) in an attempt to determine the career pathway influences a series of high need NYC practice teaching placements had on their decisions to teach in either high need urban or rural environments. The results reveal the idiosyncratic, yet powerful, impacts the NYC experience on their career pathways.

Student: Raymond Boss

Faculty Sponsor: Toke Knudsen (Mathematics, Computer Science & Statistics)

Benoit B. Mandelbrot and Fractal Geometry

A new character has joined the cast of modern day mathematics. Less than a century old, Benoit Mandelbrot's fractal geometry has appeared beside the time-tested Euclidean tradition and proven its worth. Fractals provide a new lens through which to examine the laws of complex systems and organic forms, areas where Euclid has faced difficulty. From the structure of the human lung to the erratic behavior of the stock market to the psychedelic twists and turns of the M Set, fractal theory helps to clarify and develop our understanding of what was, until recently, a towering wall of complexity.

Student: Raymond Boss

Faculty Sponsors: Brian Beitzel, Nathan Gonyea (Educational Psychology, Counseling & Special Education)

The Effects of Diagram Use in Probability Instruction and Problem Solving

Instructing students to use diagrams as problem solving aids is commonly expected to improve comprehension and achievement, especially with particularly complex or counterintuitive topics such as probability. This study addressed the effects of such an approach compared to a more algebraic, formula-based problem solving method. Undergraduate participants were tested for prior knowledge and then instructed to solve a particular type of probability task either using a diagram or a purely algebraic procedure. Immediate and delayed posttests were administered to measure the effects of using diagrams on participants' levels of achievement. Results from this study are being analyzed and will be shared at the presentation.

Students: Sheanna Burgess, Theresa Henshaw, Paige Carpenter

Faculty Sponsor: Charlene Christie (Psychology)

Eating on Campus: Vegan, Vegetarian and Omnivore Stereotyping

The research on food consumption stereotypes has demonstrated that a plethora of negative preconceived notions exist about vegans and vegetarians. However, the literature review associated meat-consumption with positive attributes. Our current study aimed at the college student's perspective on vegan, vegetarian, and omnivore lifestyles. In a two part study, we investigated the stigma attached to food consumption on campus.

Students: Angelina Burley, Christopher Mark, Serena Sackett

Faculty Sponsors: Mike Worrall, James Zians (Psychology)

Evaluation and Comparison of Two Methods of Teaching Observational Coding to Undergraduates

Observational coding is widely used in psychological research to record and measure many types of behavior, including therapist and client interactions. The coding of psychotherapy can contribute to the improvement of therapeutic practices and treatment fidelity, the verification of effective treatment delivery. Unfortunately, the task of training reliable coders can be lengthy, which can delay research procedures. Consequently, there is a demand for more efficient methods of training coders. Computer-based methods could potentially offer a faster, efficacious training process. The present study seeks to assess computer-based and paper-based methods for the teaching of observational coding to undergraduates, utilizing the Validating and Invalidating Behavior Coding Scale (VIBCS), a coding scale of moderate complexity. With a gift card incentive, up to sixty undergraduates will be recruited via the SONA system and randomly assigned to the computer-based or paper-based tool.

Participants will first be shown a training video, which explains the validation scale and demonstrates examples of each associated level. After an opportunity to practice coding interactions, subjects will code three mock therapy sessions, utilizing the corresponding tool and scale. Comparisons of reliability will be analyzed with intra-class correlation coefficients, and perceived performance and satisfaction will also be measured.

Students: Anita Burns, Caroline Curtis, Kayleigh Melite, Jamie Pitter

Faculty Sponsor: Andrew Kahl (Theatre)

Student Driven Production: Staging Identity Plays

The Identity Play Reading Series provides culturally targeted performances, opportunities for diverse performers and chances for the campus community to participate in creative artistic activities celebrating individuality and our collective diversity as a campus community. Four student producers will share their experiences guiding public performances from play selection to final presentation. The challenges of choosing appropriate material, negotiating performance rights, casting and rehearsing actors from the campus community, and promoting the final production provided hands-on experience that is unusual for undergraduate students. The project provided experiential learning and authentic practice designed to empower students as creative artists and producers.

Student: Deanna Caracciolo

Faculty Sponsor: Donna Vogler (Biology)

Survey of European Marsh Thistle (*Cirsium palustre Scopoli*) Invasion Front in Central New York

Cirsium palustre is a perennial vascular plant native to European swamps and marshes. This plant is characterized by thick, strong stems covered in medium sized spines with few off branches. The first appearance of *C. palustre* in New York was reported in Madison County in 1994. It is believed that current North American populations were once connected to the original outbreak in New Hampshire and Newfoundland. This plant moves especially well, adapted to spreading along New York States shipping passages due to a large amount of wetlands surrounding routes. A previous study revealed that the plant is moving rapidly through Central New York. This is possible due to the use of its three stages that can halt growth during difficult times as well as seed dispersal techniques. We surveyed Schoharie, Delaware, Greene and Otsego Counties during the plants flowering season and used its brightly colored purple flower to distinguish it from other plants. According to new-found distribution and demographic analysis the leading edge theory can be statistically significant. Trends are pointing toward our hypothesis and seedling survival rate seems to be the limiting growth factor which is common in many r-selection organisms.

Student: Deanna Caracciolo

Faculty Sponsor: Paul Lord (Biology)

Otsego Lake Population Assessment of Fresh-Water Mussels (Unionidae) Since Introduction of Zebra Mussels (*Dreissena polymorpha* Pallas)

Four surveys have been conducted on the Unionidae community in Otsego Lake, New York, with data collected between 1972 and 2013. We compared our findings to Harman's baseline results from 1969, which found six native species in the lake: *Alasmidonta undulata, Anodontoides ferussacianus*, *Elliptio complanata*, *Lampsilis radiata*, *Pyganodon cataracta*, and *Strophitus undulatus*. We determined that species diversity decreased between 1972 and 1999. During the 1999 survey only three species were found in the lake. After the introduction of zebra mussels (*Dreissena polymorpha*) in 2006, we documented a dramatic decline in overall unionid community size. In 2013 only *L. radiata* was alive in the lake. Hypotheses exist for the impending extirpation of unionids. Unionids are sensitive to siltation and it is possible that increased runoff from road work and construction is stressing the unionids. Unionids are also susceptible to zebra mussel infestation which, if extensive enough, is known to choke out or destabilize the unionid, leading to death. Unionids are natural bio-indicators and act as a health gauge for the lake. We anticipate the extirpation of Otsego Lake unionids within the next 2 years.

Student: Deanna Caracciolo

Faculty Sponsors: Tyra Olstad (Geography), Thomas Horvath (Biology)

Wilsbach Compost Analysis

SUNY Oneonta recently implemented an addition to its educational composting equipment in the form of an O2 composter set up by former SUNY Oneonta student Shelby Zemken. This system is in addition to the already implemented tumbling composter set up by Greg Talamini in 2012. After the first cycle of compost was completed, the biggest question regarding the composters related to the difference in compost between the two systems. Which system creates better compost? By taking samples and sending them for analysis at the University of Massachusetts, nutrient and overall soil quality for both systems was calculated. Due to variables in the tumblers maintenance during the cycle, data became difficult to compare, but a trend was observed. The O2 composter seems to have a better general compost soil when compared to the tumbler, using the University of Massachusetts analyzing scale. As Oneonta's composting system matures, compost should improve in quality.

Student: Katherine Carpenter

Faculty Sponsor: Jason Smolinski (Physics & Astronomy)

Observing Exoplanets

NASA's Kepler Space Telescope has been studying the sky since 2009, looking for stars that could have planets orbiting them. These extrasolar planets, or exoplanets, can be detected by measuring the brightness of the star they are orbiting before, during, and after the transit of the planet. A transit is a planet passing in front of the star it orbits. Kepler's job is to identify possible exoplanets, but NASA requires ground-based observations that verify Kepler's findings to confirm the existence of the exoplanets. This project has attempted to determine if SUNY Oneonta's equipment can be used to confirm the existence of Kepler Objects of Interest. Using the SUNY Oneonta Observatory's 16-inch telescope, we obtained photometric data for a star known to have an exoplanet, XO-3, to test the expected dimming of the star.

Student: Naomi Carter

Faculty Sponsor: Betty Wambui (Africana & Latino Studies / Women's & Gender Studies)

Cinematic Influences on Culture and Traditions in Western and Northern Africa

Film has the ability to impact cultures and communities in a variety of ways. It holds the power to create change and movement amongst the audience, as well as inform the viewers of stories affecting the world and their own communities, thus being an educational tool to help promote a stabilized society. For example, film aides in developing one's sense of self including their placement and purpose in society. People often look to media outlets as a source to observe representation of their self, further creating an identity and goals based on of this representation. Problems can arise, however, when this representation is hindered or lacking in the ethnic community where the films are being presented. The African film industry, in particular, has been through various difficulties politically and economically throughout history. Despite these difficulties, it had succeeded in making a global impact in promoting African customs and ideals. The object of this essay is to examine the cultural history of African films, as well as promote awareness to the traditional style of African film making and future developments of African Cinema.

Student: Kaitlyn Castle

Faculty Sponsor: Laura Munteanu (Mathematics, Computer Science & Statistics)

A Coordinate Geometry Approach to Concurrency and the Nine Point Circle

Coordinate geometry provides an alternative to the classical way of investigating certain geometric properties. More precisely, instead of relying on the often difficult to master geometric intuition, in many cases, one can use algebraic computations to obtain the desired results. We use this approach in this presentation to look at several classical results involving concurrency and the Nine Point Circle in Euclidean geometry.

Student: Michelle Castore

Faculty Sponsor: Tracy Betsinger (Anthropology)

Fill the "Dentin" Your Tooth Knowledge

Human teeth and associated structures can be subject to a number of pathological conditions, many of which are related to diet. These conditions have complicated etiologies, but each affects the oral cavity in a unique way, which can be observed in skeletal remains. Periodontal disease is the inflammation and infection of the periodontal tissues that surround and support the teeth. Periapical lesions are the result of cariogenesis, leading to a localized infection at the apex of the tooth root. Dental caries is a bacterial infection leading to the destruction of enamel and dentin related to dental plaque. Antemortem tooth loss results from loss of bone support as well as severe carious lesions. Enamel defects reflect metabolic disturbances in the formation of enamel. The focus of this study was to assess a collection of skeletal remains for these five dental pathological conditions. A total of 15 human dental remains were assessed for each condition, and the presence or absence was noted. The location and severity were also recorded for each affected tooth. Results indicate that antemortem tooth loss was the most common pathological condition, with 9 of the 15 skulls showing evidence of its presence.

Student: Shing Chung Z. Chiu

Faculty Sponsor: Sen Zhang (Mathematics, Computer Science & Statistics)

Raspberry Pi Quadrotor

In this Raspberry Pi hover project, the Raspberry will become the flight control board to control 4 motors. It will also host as a server that receives command from user and send status from the hover. The reason to choose Raspberry Pi is because it can provide more computing power than the existing Quadrotor on the market. Modifying the Quadrotor to meet different goals would be easy since Raspberry runs on Unix system. With the extra calculating power, the Raspberry Pi Quadrotor will be able to perform more automation tasks such as road searching, GPS, 3D scanning and face detection.

Students: Leland Cohen, Joseph Spaulding

Faculty Sponsor: Leslie Hasbargen (Earth & Atmospheric Sciences)

Geologic Maps in a Google Fusion Table Environment: A Case Study in New York

The goal of this project was to create, color, organize and share geologic maps in a Google Fusion Table. There are several advantages to using Google products. One, the data reside on Google servers; two, the Fusion Table app provides a means of organizing, analyzing and visualizing the data; and three, these resources make the geologic data easily accessible, shareable and free. Geologic data for New York State has been published by the New York State Museum, both in printed maps and in GIS format. While this data is available to the public, there has not been an easy way to visualize and analyze the data. Here we present the steps required to move geologic data from the native format (shapefile) into the Fusion Table, and then offer suggestions on the use of the database functionality in the app. The maps are available online, in a clickable, searchable, filterable, tabular, downloadable and graphical format. We believe that the ensemble of functions in the Fusion Table can lead to exciting virtual fields for exploration and data dissemination, especially for geoscience educators.

Student: Benjamin Coyle

Faculty Sponsors: David Wong, Paul Lord (Biology)

Biofouling of Invasive Zebra Mussels (*Dreissena polymorpha*) in Otsego Lake, New York

Invasive species are threats to the world's environments and economies, but what many don't know is that Otsego County is fighting a battle with its own invasive species. Zebra mussels and quagga mussels are arguably the most serious non-indigenous biofouling pests introduced to North American freshwater's, and are among the world's most economically and ecologically damaging aquatic invasive species. Although zebra mussels were first found in Otsego Lake in 2007, they have become an immediate nuisance for the Cooperstown Water Treatment Plant (CWTP). Our experiment used

the same type of materials used by the CWTP. Relative adherence rates show that not only did the zebra mussels show higher adherence on iron substrates, but the settlement of larval veligers was highest at the end of our sampling period (late summer). As a result the CWTP will know when to dose potassium permanganate to the water pipe for disinfection. Acting at the optimum time will minimize the dosing of the potassium permanganate chemical into the water, thus saving money in terms of the cost of chemicals and avoiding excess contamination of the water.

Student: Alyshia Crawford

Faculty Sponsor: Sean Robinson (Biology)

A 50-year Assessment of Vegetation Change on Mt. Marcy

The High Peaks region of the Adirondack Mountains of New York State holds some of the southernmost communities of alpine vegetation in the eastern United States. Containing the greatest concentration of rare and endangered species found in New York State, this ~12,000-year-old ecosystem is important to the ecological history and biodiversity of northeastern North America. In order to determine floristic diversity and document vegetational shifts over time in the Adirondack alpine zone, a 300-ft permanent transect was established on the summit of Mt. Marcy in 1957. This transect was sampled in 1959, 1981 and 2009, providing a unique data set representing 50 years of change. While total percent cover did not change since 1959, vegetation composition changed significantly along the transect. In particular, there was a significant increase in sedge meadow species and a significant decrease in shrub-heath species. Given the location of this transect on the windward side of the summit, these changes may be due to a natural successional pattern not yet documented. These results, however, are in line with previous work investigating effects of atmospheric deposition on alpine plant communities.

Student: Matthew Dami

Faculty Sponsor: Sean Robinson (Biology)

Animal-Facilitated Dispersal of Bryophyte Spores in Northeastern U.S. Forests

The objective of this study was to determine the potential role of small mammals in the dispersal of bryophytes via endozoochory. We trapped 77 rodents at three forested sites in central New York and collected six fecal pellets from each. To detect the presence of spores, bryophyte material was separated out of fecal samples and examined under a light microscope. Additional fecal material was sterilized and cultured on a nutrient agar to test for spore viability. As a comparison, 20 sporophytes and associated gametophytic material of two bryophyte species (*Dicranum flagellare* and *Polytrichum commune*) were fed to each of 18 laboratory mice in two separate experiments. Three-pellet samples were collected daily for four days from each mouse for each bryophyte species. We performed the same fecal observation and culturing techniques used with the field-collected samples. An average of 1,626 field-collected, 28 *D. flagellare*, and 4,333 *P. commune* spores per sample were detected. Bryophyte growth was found in 1.4% of *D. flagellare* and 40.3% of *P. commune* samples. No growth from spores was observed in the field samples. Our results indicate that mice consume bryophytes and that bryophyte spores are able to remain viable after being digested.

Students: Erica Darpino, Rebecca Russell

Faculty Sponsor: Florian Reyda (Biology & Biological Field Station)

Gastropods and Fish as Hosts of Digenetic Trematodes in Otsego Lake and Nearby Waters

This is a study of digenetic trematodes as part of a survey of the intestinal parasites of fishes of Otsego Lake and its tributaries (Cooperstown, New York) in which 27 species of fish were examined. Among the fish examined, eight fish species were infected with the adult stage of a digenetic trematode species in the digestive system, whereas most fish species were infected with a larval stage (i.e. metacercaria) in other organs. Once adult trematodes from fish were identified to species, the scientific literature was reviewed in order to compile life cycle information and determine what other organisms in the ecosystem are possibly serving as hosts for larval trematodes. Following this, a survey of the snails was undertaken. The survey included six species of snails, three of which were

infected with stages of larval trematodes (redia, sporocysts and cercaria). Techniques used to identify redia, sporocysts and cercaria included light microscopy, scanning electron microscopy and DNA sequencing in combination with known life cycle information. Another identification technique that is currently underway is a live-staining technique to identify cercaria. Given that trematode life cycles utilize the food web, this data adds to growing knowledge of the overall ecosystem of Otsego Lake.

Student: Emily Davidson

Faculty Sponsor: Jennifer Withington (Biology)

Biochar Impacts on Vegetables Grown in Central New York Soils

Research shows that biochar (biomass-derived black carbon) has the potential to increase crop yields and resilience, improve soil health and mitigate climate change. Since a paucity of current scientific literature on biochar relates to local soils and temperate climates, our objective is to ascertain the effectiveness of biochar on vegetable growth, and potentially facilitate local biochar use, both for local gardens and for Central New York commercial agriculture. Biochar ground to a fine powder of 1mm particles will be mixed with bovine effluent, and left to charge in a sealed bucket for 2 weeks. The biochar mixture will then be added to the half the soil at the standard ratio of 1kg biochar per m2 of soil. We will plant 10 corn and tomato plants with biochar treated soil, and 10 corn and tomato plants without biochar treated soil. We expect to see results that indicate that the addition of biochar to local soils substantially increases crop growth.

Student: Cristina De Marco

Faculty Sponsor: Philip Sirianni (Economics, Finance & Accounting)

Biodiversity and Tourism

This project assesses the relationship between biodiversity and tourism using a cross section of countries throughout the world. My research will identify the determinants for tourism, and whether nature, and biodiversity in particular, is correlated with tourism receipts. Biodiversity is crucial to human development, and its conservation has a significant impact on the human population. Countries that are rich in biodiversity have been making an impact in the tourism industry, which has been growing rapidly throughout the world. In my presentation, I discuss the importance of biodiversity and the impact it has on tourism by examining the correlation between the Global Environment Faculty biodiversity index and tourism receipts, from the World Bank Data, while controlling for other factors that affect tourism receipts such as the number of protected areas, km of coastline, real GDP, number of bird species per country, number of endangered species per country, etc. Understanding the relationship between biodiversity and tourism, especially ecotourism, is vital in determining how they interlink.

Students: Brittany Decker, Dominick DeNofio, Rebecca Zopf

Faculty Sponsor: Charlene Christie (Psychology)

Concealing Identities: Social Anxiety and Stereotype Endorsement Among the Lesbian, Gay, and Bisexual College Population

This research examined factors impacting feelings of social anxiety and perceptions of stereotype endorsement among people who belong to a concealable stigma group. In this study we specifically examined members of the lesbian, gay, and bisexual (LGB) community, focusing on perceptions of social support and feelings of social anxiety. Our results revealed significant differences in social anxiety and perceptions of stereotype endorsement between heterosexual, LGB, and straight allies of the LGB community.

Student: Illari Delgado

Faculty Sponsor: Florian Reyda (Biology & Biological Field Station)

Tapeworm Species of the Genus *Bothriocephalus* of Otsego Lake, New York

Worldwide the overall scope of knowledge on tapeworms is notably poor. This is even truer for the available information and research done on freshwater tapeworms in the United States. In an effort to

better enhance this knowledge, the goal of this study is to select a tapeworm species from Otsego Lake to taxonomically revise. Collectively, Otsego Lake contains three tapeworm genera, *Proteocephalus*, *Glaradacris*, and *Bothriocephalus*. Among these, species of *Bothriocephalus* were examined as potential subjects of future taxonomic work. Further studies on morphology were done using scanning electron microscopy (SEM) and light microscopy on tapeworms collected from 2009-2014. Specifically, features such as the scolex, bothria and segmented structures most anterior to the scolex are best in distinguishing different species. As far as possible hosts, the genus is known to occupy the anatomy of Walleye (*Sander vitreus*), Creek chub (*Semotilus atromaculatus*), Golden shiner (*Notemigonus crysoleucas*), Bluegill (*Lepomis macrochirus*) and most notably the Yellow perch (*Perca flavescens*). Our preliminary data indicate that there are two species of *Bothriocephalus* in the lake, *Bothriocephalus acheilognathi* and *Bothriocephalus cuspidatus*. *Bothriocephalus cuspidatus* will be the focus of future taxonomic work.

Student: Dominick DeNofio

Faculty Sponsor: Elizabeth Seale (Sociology)

Race and Ethnicity: The Demographics of Being Penalized in Welfare-to-Work Programs

The purpose of the study is to explore correlations that exist within the welfare system between the penalization of individuals (sanctioning) and their demographics. The interest for this study developed during the initial cleaning of the Temporary Assistance for Needy Families (TANF) welfare data. After obtaining the raw data and cleaning it for analytic use, a logistic regression analysis was run and multiple correlations were found and expanded upon. One of the initial hypotheses – that education would play a role in the frequency of penalization (sanctioning) – was later found to be have an indirect effect.

Students: Richard DePasquale, David Loveless, Anthony Baum

Faculty Sponsor: Melissa Godek (Earth & Atmospheric Sciences)

Air Mass Frequency During Precipitation Events in the United States Northern Plains

Since 1980, numerous billion-dollar disasters have affected the Northern Plains, including nine droughts and four floods. The atmospheric environment present during precipitation events can largely be described by the presiding air mass conditions, since air masses characterize a multitude of meteorological variables at one time over a large region. Therefore, understanding the relationship between air masses and rainfall episodes can contribute to improved precipitation forecasts. Frequency of air masses, defined by the Spatial Synoptic Classification, is analyzed for regional precipitation events. Both annual and seasonal air mass frequencies are assessed at the time of precipitation. Additionally, air mass frequencies are obtained for positive and negative phases of the Pacific/North American Pattern to examine the influence of teleconnection forcing factors on the air mass types responsible for producing precipitation quantities. Results indicate that the Transitional air mass, associated with changing air mass conditions commonly related to passing fronts, is not the leading producer of rainfall in the region. The moist air masses, Moist Moderate, Moist Polar, and Moist Tropical, are the most frequent air masses present during precipitation events. Interestingly however, there is a tendency for precipitation associated with dry air masses in the north and west within the study region.

Students: Steven Doolittle, Kyle Madden, Michelle Spencer, Lexi Swartwood

Faculty Sponsor: Geoffrey O'Shea (Psychology)

The Relationship Between Response Speed, Memory Performance, and Awareness in an Implicit Learning Task

Speed of processing, or the amount of time intervening between the presentation of a stimulus and the response, has been found to correlate with aspects of cognitive performance such as IQ and inhibitory control. While fast responding is considered to be evidence of efficient processing in most cognitive tasks, it is unknown whether fast responding in serial recall tasks is evidence of stronger or weaker memory than slow responding. For example, slower recall may demonstrate more deliberate and

careful responding and also lead to a more accurate memory for the information. In the present experiment, quartile analysis was used to designate fast and slow response groups based on the average reaction time of their recall responses in a serial learning paradigm, the Hebb Digits task. The results showed that overall memory performance was greater for the fast responders compared to the slow responders, despite demonstrated learning of the incidental elements of the task. Furthermore, self-reported awareness differences were found between the two groups. The results indicate that speed of processing is related to the capacity to store information in a memory task and that faster, rather than slower, processing is more beneficial to memory accuracy in a serial learning paradigm.

Student: Mariel Doyle

Faculty Sponsor: Philip Sirianni (Economics, Finance & Accounting)

Pigouvian Taxes with Interacting Pollutants

The purpose of this research is to capture the effect interacting pollutants, namely carbon dioxide and sulfur dioxide, have on determining an optimal tax rate. The relationship these environmental pollutants have independently on overall damages is marginally increasing; however, when analyzed together, the marginal effect of carbon dioxide decreases with an increase in sulfur dioxide. This dependency of pollutants is evaluated by using generalized variables to determine how best to optimize societies welfare through efficient regulation. The scope of application is limited to competitive firms. The long-run efficiency of firms will result in how best to set a Pigouvian tax when taking into consideration the diminishing damage effect of sulfur dioxide on carbon dioxide, instead of a generalized pollution function in which all emissions are marginally increasing.

Students: Danielle Dragotta, Kevin Flessa

Faculty Sponsor: Jacqueline Bennett (Chemistry & Biochemistry)

Synthesis of Thiosemicarbazones Using Green Chemistry

Thiosemicarbazones are a class of compounds with antibacterial, antifungal, and antiviral properties. Recently, they have been found to be useful in the development of antitumor drugs. The purpose of this project was to synthesize thiosemicarbazones using green chemistry methods, as opposed to traditional, less benign methods. Green chemistry focuses on the development of products and processes that minimize the use and production of hazardous materials. The traditional methods required boiling in organic solvent for several hours. Our newer, green method uses mostly water containing some lactic acid, an additive to food products, as the solvent. The reactions require no boiling, are complete in under 15 minutes, and result in good to excellent purities and yields without purification. A total of 18 thiosemicarbazones have been made so far by this method.

Student: Alyssa Dubbs

Faculty Sponsor: Melissa Godek (Earth & Atmospheric Sciences)

The Impact of Meteorological Storms and Events on Human Injury and Mortality in Florida, USA

Several weather phenomena occurring in Florida have been extremely dangerous to humans. Florida is known as the thunderstorm capital of the United States, having more severe storms than any other place in the country. Thunderstorms, lightning, high wind, hail, rip tides, and heat waves are some examples of phenomena that cause serious injuries and fatalities. This project aims to analyze NOAA's Storm Database to find significant correlations in when these meteorological phenomena are occurring. By grouping storm data from 2006-2012 into two categories, injuries and fatalities, correlations between when these events are occurring and the day of the week can be made. The data is also split by parts of months to determine when storms are occurring more frequently, and then by seasons. Furthermore, sub-regions in Florida are established by proximity to the coast in order to create a map highlighting warning regions by week, month, or season. This research may serve as a potential preventative measure for saving lives and avoiding serious injuries.

Students: Michelle Eckler, Marisa Hitchcock

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

The Effects of Using Avocado Puree as a Fat Replacement on the Sensory Qualities of Oatmeal Cookies

Currently, there is much concern over the high rates of overweight and obese Americans. The health risks of being overweight and obese, such as diabetes, heart disease, and certain cancers, are well-known. Given this, it is essential to find ways to limit the amount of fat consumed. One way this can be done is by using fat replacers in food products. In this study, avocado puree was substituted for 0%, 50%, 75%, and 100% of the butter in oatmeal cookies. Thirty consumers evaluated each cookie for appearance, color, taste/mouth feel, moistness, and overall acceptability. Based on their scores, it was determined that oatmeal cookies made with 50%, 75%, and 100% butter replacement with avocado puree are all acceptable. Cookies made with 50%, 75%, and 100% fat replacement with avocado puree have significantly less calories, fat, saturated fat, and cholesterol. An acceptable substitute for butter, avocado puree can help cut calories and obesity rates without sacrificing important characteristics including taste and moistness.

Students: Michael Elliott, Zach Rose

Faculty Sponsor: James Zians (Psychology)

Establishing Reliability and Validity on New State Pivot Measures: Anger, Sadness, Anxiety, Dependency, "Need for Power," Dominance/Submissiveness, Excitement, Openness and Blaming

This study focused on establishing psychometric properties of a new measure called "pivot scales." Pivot scales are modified visual analogue scales represented by item sets of three, each item utilizing a 10 centimeter line with a pivot mark in the center anchoring the scale at how the participant usually feels and providing a rapid method of capturing the effects of a mood induction. A pivot scale can assess current mood state following the mood induction while simultaneously capturing a difference score between a subject's baseline mood and current mood. This presentation will combine past pilot study work with five mood-state pivot scales (anger, sadness, dependency, "need for power," "blaming") with newly developed pivot scales (anxiety, agreeableness, excitement). While data collection for this study is currently underway, results of the initial five pivot measures have been completed. Convergent validity analyses for the five pivot measures (N=305) demonstrated significant correlations for three of the five measures (anger, sadness and blaming/external attribution). Test-retest reliability and internal consistency results show promise for these new state-mood measures. Formative research on the development of the new pivot scales will be on display demonstrating the nominological network and construct explication necessary for construct validity.

Student: Matthew Esposito

Faculty Sponsor: David Wong (Biology)

Toxicology of *Dreissena polymorpha* Using Salt Compounds

Zebra mussel (*Dreissena polymorpha*) is an invasive species to the freshwater ecosystem in North America. Aquaculture equipment and boats serve as a vector for the spread of *D. polymorpha*. Chemicals that are currently used for decontamination such as chlorine-based bleaches are known to be harmful to the environment. Salt has been proposed as a tool for decontamination, but currently there is no consistent data to indicate efficacy. In this experiment, the toxic effects of different concentrations of salt compounds on *D. polymorpha* were tested. Mussels were collected from Otsego Lake and aquatic toxicology tests were conducted at the SUNY Oneonta Biological Field Station in Cooperstown, NY. Five experimental tanks containing varying concentrations of table salt (0 ppm, 100 ppm, 1,000 ppm, 5,000 ppm, 10,000 ppm) as well as five observational tanks containing lake water were prepared. The mortality rates of mussels were recorded at different time intervals. After 48 hours, it was found that all mussels survived in the control (0 ppm) and 100 ppm treatments, while 20%, 30%, and 90% mortality were found for the 1,000 ppm, 5,000 ppm, 10,000 ppm treatments, respectively.

Student: Troy Fishman

Faculty Sponsor: Jennifer Withington (Biology)

Nitrogen Fixing Plants and Green Roof Technology

Green roof technology combines architectural designs, engineering, and maintenance solutions of living green plants on any non-permeable area in the world. This technique is used to help collect rainwater (which can be used in a number of ways, as opposed to it just becoming runoff), provide insulation to buildings by giving them an extra layer of protection that helps keep heat and air condition indoors, which in turn helps to lower heating and air conditioning cost and pollution, and to help lower urban air temperature (Srebric et al., 2009).

Student: Benjamin German

Faculty Sponsor: Willard Harman (Biological Field Station)

Lake Moraine: Developing a Comprehensive Management Plan

Lake Moraine is a 263 acre artificially altered kettle lake, located in Madison County, New York. It is one of many reservoirs constructed or altered to supply water for the NYS Canal System. It is managed by the NYS Thruway Authority and the Lake Moraine Association, a member of NYS Federation of Lake Associations. The lake has been a part of the Citizens Statewide Lake Assessment Program (CSLAP) since 1986; this program provides water quality data (pH, Conductivity, Ammonia, Nitrate, Chlorophyll a, etc.) collected by volunteers. In the fall of 2013 I began work on the lake, and am implementing monitoring protocols including dissolved oxygen (absent from CSLAP data) in an effort to develop a State of the Lake Report. I am also conducting a survey of all watershed residents to determine their opinions and perceptions. Both are necessary to make management decisions. The ultimate goal is the development of a comprehensive management plan for Lake Moraine and its watershed, with the hope of supporting the best possible social services, while maintaining an ecologically sustainable system.

Student: Chelsea Ghent

Faculty Sponsor: Dona Siregar (Economics, Finance & Accounting)

Do ESG Characteristics Affect a Firm's Performance?

Increasing numbers of investors are not only looking at the financial performance in a corporation's portfolio, but are also valuing the way corporations meet their social responsibilities. One motivation in academic literature points to links between environmental, social, and governance (ESG) factors and corporate financial performance. I'm interested in examining the performance of these ESG firms and whether investors place values to these characteristics and are reflected in stock performance. Sustainable and responsible investing (SRI) is one of the most powerful trends in the sustainable business space. Why? Because money talks, as the cliché says, and companies listen to it many times much more than they listen to anything else. The result is that shareholders have the power to make companies pay attention to environmental and social issues that no other stakeholder group possesses; therefore, SRI has a potential to shake and change stock performance. This paper aims to investigate the relationship between ESG characteristics and a firm's performance. The analysis in my research will be based on the companies listed in S&P500, which is a widely accepted and well-diversified benchmark of U.S stocks. I will then further investigate whether the outperformance of the companies is related to high score of ESG. With this information I will be able to conclude a justified answer to my proposed question.

Student: Lynn Golan

Faculty Sponsor: Rhea Nowak (Art)

It's in Our Hands: An Art Initiative for the Community

Oneonta is a beautiful place to be, and we can all do our part to keep it that way. A simple smile to a stranger or picking up litter is enough to improve the community, if everyone takes part. My contribution to my community is through art. I created this project to bring art into the community and create a conversation about building solidarity through our similarities while respecting and

honoring our differences. Oneonta is home to all sorts of people, yet its mountains welcome each person equally with open and warm encouragement, and this is what we can all strive for. It is here that we grow, learn, love and connect with others. It is here that we must support positive thinking and action to encourage one another to be good citizens, neighbors and friends. My artwork represents the ever-uplifting sense of community, respect, love and solidarity that we can find when we connect to one another and to the land we share. What do you think builds a strong community and what can you do to help strengthen our community?

Student: Mollie Goodwin

Faculty Sponsor: Jeffrey Heilveil (Biology)

Genetic Diversity of Carpenter Bees (*Xylocopa virginica* (L.)) in New York State

Native bees of the U.S. play a key role in the existence of many of our native plants by assisting with pollination (Schaffer et al. 1983). This study examines the population sustainability of a native carpenter bee species, *Xylocopa virginica* (L.), using populations collected from the nine eco-regions of New York State. After a failed attempt with the nuclear gene *wingless*, the nuclear gene *PEPCK* is being amplified and sequenced. Polymorphisms were found in some DNA sequences suggesting genetic variation within a population. These DNA sequences will be used to create a phylogeny of the bees using the program Mr. Bayes. Overall genetic variation of the carpenter bees across NYS will be examined using an AMOVA (Analysis of Molecular Variance). Allelic richness and tests of Hardy-Weinberg Equilibrium will be performed on the data and used to generate a map of genetic diversity, which will allow us to assess the sustainability of this important native pollinator.

Student: Ben Greene

Faculty Sponsor: Jill Fielhaber (Biology)

Preventative Effects of Probiotic Bacteria on Intestinal Inflammation in a Mouse Model of *Clostridium difficile* Infection

Clostridium difficile is the most common hospital-acquired infection in the United States. Infection with *C. difficile* causes an array of serious inflammatory bowel disorders (IBDs). Susceptibility to *C. difficle* infection is caused partly by disruption of the composition of the normal intestinal microbiota. Previous studies have demonstrated that several individual species of probiotic bacteria may reduce the severity of intestinal inflammation in mice infected with *C. difficle*; however, no information is available regarding the effectiveness of over-the-counter probiotic preparations in the prevention of *C. difficle* infection and associated IBDs. We hypothesize that an over-the-counter probiotic formulation will reduce intestinal inflammation during *C. difficile* infection. To test this, mice will be administered tap water supplemented with an over-the counter probiotic (Kyo-Dophilus®) for one week, prior to infection with *C. difficile*. During this time, overall health of the mice will be measured daily by monitoring water consumption and body weight. After one week, intestinal inflammation will be quantified by measuring tissue edema and inflammatory cell infiltration into the intestine. We expect that mice receiving over-the counter probiotics will exhibit reduced markers of intestinal inflammation in response to *C. difficile* infection.

Student: Kaitlin Grodotzke

Faculty Sponsor: Toke Knudsen (Mathematics, Computer Science & Statistics)

Emmy Noether

Emmy Noether was an influential German mathematician who is known for her revolutionary contributions to abstract algebra and theoretical physics, developing the theories of rings, fields and algebras; and, in physics, Noether's theorem explains the fundamental connection between symmetry and conservation laws. Emmy Noether was a very important woman in the history of mathematics and physics. She was often referred to as "the father" of abstract algebra (Kleiner, 2007). Today, Noether's creativity and unique technique is recognized among mathematicians and physicians worldwide. She is remembered by mathematicians as an algebraist and for her work in topology. She is appreciated by physicists for her famous theorem. She is also recognized for her unique ways of approaching problems of mathematics.

Students: Michael Guerriere, Stacia Southcott

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Substituting Gluten in Waffles

Celiac disease is being diagnosed more each day, increasing the demand for proper education and food modifications to help these individuals adjust to a gluten-free diet. The purpose of this study was to determine if almond flour or sorghum flour would make for an acceptable replacement for all-purpose (AP) flour in plain waffles. We used a generic waffle recipe and altered only the flour content: 100% AP flour, 100% sorghum flour, 100% almond flour, 50% almond–50% sorghum flours. The 100% almond flour was considered a failure on the basis that it had poor integrity and was deemed inappropriate. On a scale of 1-5, 1 being most acceptable and 5 being least acceptable, we had participants blindly rate our products according to mouthfeel, tenderness, shape, color, density, and overall acceptability. A nutritional analysis was conducted, and the major difference was fat content in the almond flour. According to our 30 participants, the only acceptable product was the 50-50 flour mixture. Acceptance was based on rating below 3 (average scores: 100% AP flour–1.616, 50% almond + 50% Sorghum flour–2.736, 100% Sorghum flour–3.52). Although the AP was rated, it is not considered a successful product because of its expected approval.

Student: Christal Haasis

Faculty Sponsor: David Wong (Biology)

Assessing Zebra Mussel (*Dreissena polymorpha*) Survival Rates Under Winter Environmental Conditions at Otsego Lake, New York

The zebra mussel (*Dreissena polymorpha*) first established itself as an invasive species in New York in 1990. Since that time mussels have been found as far west as Colorado and California. The most common cause of this spread is when boats are transported with clusters of mussels to uninfected waters. The purpose of this research is to determine how long zebra mussels survive out of water during the winter season. The result could determine the period in which boating and fishing equipment should be left out of the water prior to transportation to a separate uninfected body of water. The study took place over the course of seven days (February 4 to February 11, 2014). After exposure to freezing conditions the survival rate was measured. It was determined that the survival rate of the zebra mussels was 0% as early as four hours after removal from the water. During the winter season, a boat or other equipment needs to be left out of the water at least four hours before it is safe to transport to an uninfected body of water.

Student: Meaghan Haugaard

Faculty Sponsor: Michael Koch (Philosophy)

The Ontology of Copyright Law

The ontology of copyright law is an in-depth analysis of the principles and building blocks that are the foundation of our current intellectual law. In order to have a broad understanding of such, certain philosophies pertaining to private property, economic and political systems are to be examined. Intellectual property, in general, is not based on one isolated factor, but multiple factors. Only by looking at these particular social constructions historically and philosophically can current copyright law be understood in its entirety.

Student: Morgan Herbst

Faculty Sponsors: Dawn Hamlin, Frank Thornton (Educational Psychology, Counseling & Special Education)

Cultural Perceptions of Disability

This presentation focuses on examining how different cultures perceive disabilities. The following four cultures were chosen to be closely studied: American Middle Class, Chinese American, Native American, and Latino. Completing research on the listed cultures may allow for additional development of education and lesson plans for teachers. Becoming familiar with the beliefs of these specific cultures may lead to increased communication and collaboration with families of these

students. Understanding cultural differences may produce amplified levels of comfort between teachers and parents or caregivers of all students with disabilities. This project seeks to explore common misconceptions that may lead educators or professionals to be biased and less effective. The presentation will provide tools to overcome stereotypes to assist in providing all students with the opportunity to succeed in educational settings; and will also present each culture's view of education and individuals with disabilities. The information portrayed is applicable for all developmental levels ranging from Early Childhood through Adolescence.

Students: Kaylee Herzog, Rebecca Russell

Faculty Sponsor: Florian Reyda (Biology & Biological Field Station)

A New Species of Tapeworm from Stingrays of the Indo-Pacific that Demonstrates Relaxed Host Specificity

This project is part of a broader effort to catalog new species of tapeworms found in elasmobranchs (i.e., sharks, stingrays and skates) from the Indo-Pacific and other regions. As this research progresses, it is becoming evident that the tapeworm populations being discovered are vastly diverse (Reyda & Caira 2006). These specimens are so morphologically different from previously described species that they require erection of new genera (e.g. Healy et. al 2009). One potentially new genus is currently being described and will be dubbed "Stillabothrium." Based on observations of morphological characteristics, there appears to be eleven distinct species within "Stillabothrium." Through the use of methods such as light microscopy, scanning electron microscopy, histological sectioning, scientific illustration, and the acquisition of multiple measurements specific to the scolex and strobila, we have completed all the components of a formal species description distinguishing an individual species (referred to as "Rhinebothriinae New Genus 3 n. sp. 3" in Healy et al. 2009) from other members of the new genus. Our preliminary work suggests that this species occurs in eleven species of stingrays, demonstrating relaxed host specificity and sharply contrasting the pattern reported for many other elasmobranch tapeworms.

Student: Robert Hillman

Faculty Sponsor: Paul French (Physics & Astronomy)

Graphical Analyses of Energy Loss in Totally Inelastic Collisions

A totally inelastic collision occurs when two moving bodies in an isolated system stick together in a collision and preserve net linear momentum, but lose kinetic energy. Using software, we have plotted relative kinetic energy loss in three dimensions against combinations of dimensionless parameters that compare the mass, velocity, and momentum of the two objects. In order to achieve insight into the energy loss mechanism and develop an intuitive connection between three-dimensional contour plots and two-dimensional families of curves, multiple parametric combinations and scales are used to determine the relationships between the critical and inflection points of the 2-D graphs and the topography of the contours. Further, all limiting cases are analyzed, yielding a compact view of an infinite set of problems.

Student: Robert Hillman

Faculty Sponsor: James Ryder (Mathematics, Computer Science & Statistics)

Hidden in Plain Sight: Using Digital Steganography to Obscure Data without Encryption

Keeping secrets hidden has been an area of particular interest since the dawn of civilization, from the common person hiding their bank password to governments engaged in warfare concealing plans of attack. In the digital age, encryption is a commonplace solution to keep all of your data secure, but encrypted data is still plainly visible and can provoke an individual to attempt to decrypt your secrets. Steganography is an alternative approach that seeks to hide information in unconventional ways so that it will not attract unwarranted attention. Classic examples of this include writing a secret letter in invisible ink on top of another, innocent-looking message. This study researches unique ways of obscuring data in plain sight using technology without encryption, initially focusing on bitmap manipulation to effectively hide images within other images. Additional techniques studied include

transforming images into sound and back again, embedding messages within images, and exploiting unused sections of file formats and network transmission protocols.

Students: Rebecca Howe, Shannon Stahl, Sophie Kolankowski, Thomas Haskins, Christopher Puoplo, Joseph Spaulding

Faculty Sponsor: James Ebert (Earth & Atmospheric Sciences)

Reinterpretation of the "Anomalous" C1 Portion of the Edgecliff Member of the Onondaga Formation at Cherry Valley, NY - an Eastern Outlier of the Bois Blanc Formation

Previous workers have described the lowest beds (C1) of the Edgecliff Limestone near Cherry Valley as "anomalous, finer grained limestones" and "markedly finer grained and darker than typical Edgecliff," but have included C1 in the Edgecliff. Near Cherry Valley, 1.22 m of C1 occur and weather in recess below the coarser skeletal grainstones of C2. C1 beds are significantly finer, dominated by echinoderm and trilobite debris with fewer bryozoans and corals than C2. The C1 - C2 contact is erosional. The highest C1 bed exhibits silt filled vertical burrows and irregular cavities. Insoluble residue from this bed includes pyritized bioclasts, glauconitic steinkerns, conodont fragments, and rare well-rounded siltstone lithoclasts with chertified fossils. Insoluble residue from the base of C2 includes glauconitic steinkerns, angular glauconitic grains and siltstone lithoclasts, reworked from C1. Oliver (1956) interpreted C1 as a laterally and temporally equivalent facies of C2. However, the C1-C2 contact is disconformable as indicated by the presence of erosional relief, exotic lithoclasts, glauconitic steinkerns and silt filled pockets and burrows. This disconformity and the lithologic and faunal differences from C2 suggest that C1 is a separate stratigraphic unit. We interpret C1 as an eastern outlier of the Bois Blanc Formation.

Student: Elisabeth Jeffrey

Faculty Sponsor: Maurice Odago (Chemistry & Biochemistry)

New Approaches to N-Heterocyclic Carbene Synthesis

N-heterocyclic carbenes have been shown to be versatile and robust ligands that form very stable coordination compounds with metals. These properties have made N-Heterocyclic carbenes become a very useful class of ligands in homogenous catalysis. Since their structures are readily modified, they have also been explored as important sources of chiral ligands for asymmetric catalysis involving many transition metals. Towards this end, we have focused on the synthesis imidazolinium based salts, which are excellent precursors for N-Heterocyclic carbenes. The syntheses of these salts are achieved by a series of reactions starting with the formation of diimines, which are then easily reduced to diamines, and lastly followed by ring closure to form imidazolinium salts. Imidazolinium salts are stable, and treating them with strong bases such as potassium tert butoxide generates their respective carbene ligands. Most of the existing ring-closing procedures require extremely moisture and air free environments. However, we sought to synthesize these compounds under different conditions that are simpler, cheaper and milder. Here we present the findings of this study.

Student: Amber Johnson

Faculty Sponsor: Kevin Gray (Art)

Educational Advertisement: Spreading of Knowledge Through Visual Means

The object of this creative work is to inform students about important information that affects them and the people around them. I chose the topic of minority groups on campus. I created informative graphics that will be seen on daily routines, resulting in knowledge gained and a better understanding of an effective topic. I gained information through research, using on campus resources, campus officials, campus clubs, students and faculty, as well as regional informative sources online. The outcome of this research is for the information I present to circulate around campus and cause conversation, education and social awareness.

Student: Derek Johnson

Faculty Sponsor: Willard Harman (Biological Field Station)

Panther Lake's Unique Cyanobacterium, *Gloeotrichia echinulata*

During July 2013, while undertaking the limnological monitoring necessary for the development of a comprehensive management plan for Panther Lake, Oswego County, NY, I encountered the unique cyanobacterium, or blue-green algae, *Gloeotrichia echinulata*, living on the bottom in the deepest part of the lake. There are few other local blue-greens having a shape anything like this (Wehr and Sheath, 2003). Like many species of cyanobacteria, *Gloeotrichia echinulata* is indicative of enriched waters. Many are distasteful, even toxic, and therefore comparatively undesirable food for animals higher in the food web. This species has been recorded from oxygenated sediments having high levels of phosphorus. As oxygen is used in deep water over the summer in environments like Panther Lake, the exposed sediments also become anoxic and gas vacuoles form in the colonies lifting them up into the water to become free floating organisms (John, et. al. 2002). Later in the season the colonial filaments will begin to die and be replaced with thicker, heavier ones and sink back to the bottom. By utilizing a specialized cell known as an akinete, a *Gloeotrichia echinulata* spore is able to overwinter on the sediment until the next season.

Student: Nicholas Juliano

Faculty Sponsor: Jason Smolinski (Physics & Astronomy)

Constructing and Utilizing a Flat-Field Calibration Device for Astronomical Image Correction

Imaging and data collecting in modern astronomy is typically accomplished through the use of charge-coupled devices (CCDs) attached to professional-grade telescopes. While CCDs are the forerunner in astronomical observations, they are not without flaws. Many of these flaws can be corrected with the appropriate calibration steps. One calibration step that SUNY Oneonta's observatory lacks is a flat-field correction, which allows the user to correct for non-uniformities in the illumination of the CCD chip or variations in pixel sensitivity over the spread of the CCD chip. Furthermore, flat-field correction, in the form of imaging a uniformly lit surface, eliminates the effects of dust, a nearly inevitable factor in all astronomical imaging. We attempted to construct a flat-field illumination device to allow for such calibrations.

Student: Scott Keefer

Faculty Sponsor: Keith Brunstad (Earth & Atmospheric Sciences)

Atypical Cavern Development in the Manlius Limestone, Schoharie County, NY

A thin band of Late Silurian-Early Devonian rock stretches from the western part of New York State to the Hudson-Mohawk region, and extends southwards to Poughkeepsie. Secret Caverns, located 25 miles from Albany, is a nearly straight vadose-phreatic passage oriented 45° to the regional dip – without obvious structural or sedimentological control. The purpose of the study lay in defining the forces responsible for cavern development. Possible reasons for the observed trend of the cave were: 1) preferred water flow along existing joint sets, 2) a fault running through the cave, 3) a sedimentological confining layer, and/or 4) surficial geomorphological controls. We currently believe that Secret Caverns may have formed as a result of surficial processes. Joint patterns in the vicinity do not parallel the stream passage, although there is some evidence that the entrance vadose passage may be joint controlled. Both thrust and normal faults are present in the region, but neither have been observed within the cave proper. In the end, the most significant feature of the Secret/Bensons system appears to be the large number of aligned domes that parallel the main passage. We believe that these may have formed as a result of paleostream piracy or contact sink development.

Student: Amanda Kent

Faculty Sponsor: Toke Knudsen (Mathematics, Computer Science & Statistics)

History of Mathematical Games and Puzzles

Mathematical games, riddles, questions, and puzzles have a long history, going back as far as about 1600 BCE. They range from simple arithmetic or logic puzzles that can be done without pencil and

paper to large complex problems far beyond most people's knowledge. Mathematical riddles, games, and puzzles are found all throughout the history of mathematics ranging from ancient civilizations in Egypt to modern civilizations today. There is no real knowledge of where puzzles and games were first used in mathematics, or where mathematics was first used in puzzles and games. Some mathematical games and puzzles have even led to new mathematical discoveries. Puzzles and games that involve math are a very useful tool to either teach people mathematics, or to keep the brain exercised. Some can even help slow down the progress of some diseases such as Alzheimer's. I have focused on a few popular mathematical puzzles and games including word problems, magic squares, the Tower of Hanoi, and casino games.

Student: Emily Knapp

Faculty Sponsors: Brian Lowe (Sociology), Brian Dolber (Communication Arts)

The Political Economy of Walmart in Central New York

Walmart, the nation's largest private employer and retailer, has recently attracted a wide array of critics. This ethnographic study examines the impact of a Walmart supercenter on the surrounding community. The first component of this research was identifying the primary allegations coming from the media, the public and academics, and establishing their validity. The second component was identifying the claims made by Walmart in their ad campaign, *The Real Walmart*, released in May 2013 in response to the negative attention. Interviews with Walmart associates, customers, competing small businesses, and other community members explored these issues in the towns of Oneonta, Norwich and Cobleskill. The main themes addressed are poverty-level wages, a corporate culture of sexism, racism and able-ism, and the exploitation of corporate power. The finished product will be a documentary exploring the issues' effect on the central New York region, including improved labor and sustainability practices that could benefit both Walmart and the local community.

Student: Kajee Kodrich-Quick

Faculty Sponsors: Sunil Labroo, James Michels (Physics & Astronomy)

Birefringence and Magnetic Thin Film Studies

This research project utilizes a Magneto-Optic Kerr Effect (MOKE) measurement system (purchased using recent infrastructure funding) to analyze the polarized optical laser scattering from various magnetic thin films, as well as to analyze the birefringence of various transparent crystalline structures including solar photovoltaic materials. This study provides experience working with optical systems such as lasers, optical polarizers [3], optical detectors [4], and low noise signal detection methods. This ongoing magneto-optic thin film research project provides measurements of the hysteresis loops of the material magnetization versus applied external magnetic field magnitude. These optical measurements will be analyzed to determine possible correlation with independent Hall Effect measurements currently being studied under a separate student research project within the SUNY Oneonta Thin Film Research Lab. The birefringence analyses provide measurements on a calcite crystal, strained Plexiglas, and solar photovoltaic materials obtained through collaboration with Binghamton University.

Student: Sophie Kolankowski

Faculty Sponsors: Leslie Hasbargen, Pragnydipta Sen (Earth & Atmospheric Sciences)

Martian and Terrestrial Gullies: How Similar Are They?

Crater walls on Mars exhibit gullies strikingly similar to gullies on Earth. But how similar are they? Decreases in downstream slope are typical for terrestrial drainage basins. In addition, terrestrial gullies often exhibit a threshold in the area-slope relation – particularly for gullies formed as a result of debris flow generation. Do Martian gullies exhibit concavity and a threshold in the area-slope relation? To answer this question, we took advantage of elevation data sets from NASA's HiRise program. We generated synthetic watersheds through Global Mapper, and extracted drainage area and stream gradient of streams as well as slopes of parallel ridges. We measured cross slope and downslope profiles to document gully form and observe downcutting trends to compare to the parallel

ridge slope. We will compare the measurements to terrestrial gullies in comparable settings (escarpments and craters) between Mars and Earth. We find that gullies on Earth generally yield a higher slope than those on Mars. In addition, slopes between gullies and their adjacent ridges show no significant differences. This suggests that Martian stream erosion may not have persisted for sufficient periods of time to develop concave valley profiles.

Student: Daniel Kopec
Faculty Sponsor: Willard Harman (Biological Field Station)

The State of Cazenovia Lake: Working towards a Comprehensive Management Plan

Cazenovia Lake, located in Madison County, is an important community asset and a focus for recreational enjoyment and fishing. Nutrient enrichment has caused the lake to be placed on the NYS Priority Waterbodies List as "threatened" due to excessive aquatic macrophyte growth that interferes with recreational use. Herbicides have been applied in 2009, 2010, and 2012 to help control Eurasian watermilfoil. In 2012 and 2013, Cazenovia Lake exhibited blooms of cyanobacteria (blue-green algae). A Cazenovia Lake and Watershed Management Plan was completed in 1992, drawing on monitoring data collected in 1990-1991. Cazenovia Lake and its watershed have not remained static over the past 22 years; a nutrient budget update is needed to reflect the changes in land use and to assess the effectiveness of the many efforts of pollutant loading. Since these changes have occurred, I will be developing a comprehensive lake and watershed management plan for Cazenovia Lake while working towards my Master's degree.

Student: Courtney Kurtz
Faculty Sponsor: Dawn Hamlin (Educational Psychology, Counseling & Special Education)

Lit – Does it Fit? Portrayals of People with Disabilities in Literature

For this project, the research team looked at books ranging from pre-school to high school level that deal with characters that have disabilities. There are many biases found in literature such that a person with a disability may be portrayed as a victim or someone to feel sorry for, for example. Although there are biases in literature, literature can also be used as an important tool. As inclusion becomes more widespread, literature about disabilities can become a powerful tool. It is important to think about how we portray people in literature with disabilities, as it can be used to promote acceptance of those who may have disabilities. This presentation hopes to make viewers more aware and accepting of all disabilities not only in society but in literature as well.

Student: Alexander Lawrence
Faculty Sponsors: Sean Robinson (Biology), Trevor Fuller (Geography)

Measuring Bryophyte Colonization Patterns

Dispersal plays a critical role in the survival of fragmented populations. In plants, dispersal is the mechanism by which they colonize new habitats, escape competition, and exchange genetic material. Bryophytes disperse using widely varied dispersal strategies with three different types of diaspores: spores, asexual propagules, and fragments. For this reason they offer a good model to answer questions concerning plant dispersal. Little is known, however, about growth rates and colonization patterns in bryophytes. We conducted a series of growth experiments to determine rate of growth for each diaspore type using *Tetraphis pellucida*. In addition to being a ubiquitous species in northeastern forests, *T. pellucida* was chosen because it is known to disperse regularly using all three types of diaspores. Percent cover was calculated using a newly developed method that utilizes remote sensing techniques to analyze digitized images taken at regular intervals. This method will be used to monitor bryophyte growth at three different SUNY Oneonta Biological Field Station locations established in 2012 as part of a long-term project aimed at investigating bryophyte dispersal patterns. The results of this study will enable us to have a better understanding of the rate and pattern by which different species colonize a given location.

Student: Nanhee Lee

Faculty Sponsor: Brett Heindl (Political Science)

The Internalization of Global Governance: A Focus on Internet Governance

Previous studies about globalization and informatization have claimed that communication technology, along with the Internet, have offered important information standards for the globalization of production, finance, marketing, and culture. However, the analysis of globalization and information-oriented society needs to proceed towards how each nation, each international organization, and transnational capital associate with each other beyond what previous studies have done. Therefore, this research uses mixed methodology to describe the internalization of internet governance, which has been established according to certain procedural rules. The first question becomes, "Where do internet users reside in the world?" In order to answer this question, the research deals with high-speed internet penetration based on a regression analysis. In addition, using the perspective of qualitative study, the research examines social networks surrounding some of the main bodies underpinning internet governance. It shows that international changes in society and the internalization of global governance has experienced problems due to the Internet Corporation for Assigned Names and Numbers (ICANN). Unfortunately, agreements which are required of the various participants do not mean an equal and horizontal internalization of internet governance. The findings suggest the influence of internet governance by ICANN and related bodies.

Student: Marlaena LeMaitre

Faculty Sponsor: Dona Siregar (Economics, Finance & Accounting)

The Impact of Asymmetric Information on IPO Underpricing

Why do companies experience high initial return on the first day of IPOs? How do informed investors profit from underpriced IPOs? Is there any relationship between background characteristics of directors and IPO underpricing? Firms need to raise capital to expand their business, and a popular way to do this is to make a stock offering. In the past, initial public offerings have had large first day gains in comparison to the performance of the rest of the market. Assuming that the market price of the stock is representative of the company's value, then the huge gains could reflect the fact that the IPO issuing price is below the actual value of the firm. This project explores why companies may intentionally underprice their IPOs and how asymmetric information effects the underpricing of IPOs. The asymmetric information is between informed and uninformed investors, where informed investors tend to benefit. I will discuss Rock's hypothesis of adverse selection in IPOs, which implies a negative correlation between IPO returns and allocations to investors. One implication of Rock's theory was developed in Beatty and Ritter (1986). They suggest that the greater the uncertainty about the value of the issuing firm from the investor's perspective, the greater the underpricing was needed to attract uninformed investors to buy the new issues. Some background characteristics, including education, experience, and networking of boards may contribute to reducing asymmetric information. Therefore, the IPO market would increase in efficiency and firms would be able to receive more proceeds from its IPO when underpricing is lower. I will use more recent year data to answer the research question. Data will be from Jay Ritter's website, IPO Scoop, S-1 form, Compustat, and the Bloomberg terminal.

Student: David Loveless

Faculty Sponsors: Melissa Godek, Jerome Blechman (Earth & Atmospheric Sciences)

Developing a Climatology of Snowfall Events in Oneonta, New York

With a cold season average of 172 cm of snowfall since 1981, Oneonta, New York can be significantly impacted by snow events. The geography of upstate New York allows for Oneonta to receive snowfall from a variety of storm types including Coastal Storms, Colorado Lows, and Lake-effect storms. The goal of this research is to gain an improved understanding of snowfall events in Oneonta by identifying storms that produce snow the most often, storms that produce the most intense snowfall. Results indicate that snowfall is highly variable from season to season. Lake-effect snow and Alberta Clippers are found to be the most common types of snowfall in Oneonta. Coastal Storms

tend to produce the most significant snowfall, despite Oneonta's inland location. Changes in snowfall patterns since 1981 are identified and show that the number of days with measurable snowfall tends to be increasing, as has the number of lake-effect snow days. Additionally, the first (last) day of snowfall has been occurring 0.46 (0.32) days earlier, on average, than in previous years. Analysis of the influence of the North Atlantic Oscillation (NAO) and El Nino Southern Oscillation (ENSO) on snowfall patterns in Oneonta, NY indicate that the NAO is much more influential than ENSO during the winter months.

Student: Jason Luce

Faculty Sponsor: Willard Harman (Biological Field Station)

The State of Hatch Lake and Bradley Brook Reservoir: Creating a Comprehensive Management Plan

Comprehensive lake management allows professionals to study freshwater systems in order to make informed decisions about future goals and strategies. These strategies may be along the lines of protection, restoration or management. The town of Eaton in Madison County is home to two freshwater class B lakes, Hatch Lake and Bradley Brook Reservoir. The two lakes are dimictic, stratifying twice a year, classified as mesotrophic, or moderately productive, and are part of the Susquehanna River drainage basin. Surveys sent out to residents from both lakes showed the top four environmental concerns to be: increased macrophyte growth, increased phytoplankton growth, undesirable introductions of plants/animals, and sanitary waste from cottages. Electrofishing surveys were conducted in the fall of 2013 and show a great deal of useful information about the current fishery of each lake. Fishery information such as age-class structure and relative abundance for fish species present help managers make informed decisions about the current and future fishery. Hatch Lake has shown evidence of anoxic conditions in the latter part of the summer, causing internal loading. Future management for both lakes will be focused on nutrient reduction strategies.

Students: Alyssa Lupinski, Brittany Alfarano

Faculty Sponsor: Michael Brown (Psychology)

The "Battered Spouse Syndrome" – Mock Juror Decisions in Cases of Same- and Opposite-Sex Violent Resistance

This study examines mock juror decisions in cases of abusive relationships where one party is claiming self-defense after killing his/her partner. More specifically, we were interested in whether the "battered woman syndrome" defense would be equally effective in cases involving straight and same-sex relationships. We used a 2(gender of defendant: male vs. female) x 2(gender of victim: male vs. female) between-groups design. Participants read a summary of a trial where a defendant was being charged with first-degree murder for killing his/her partner. The defendant claimed that the killing was in self-defense, after years of physical and emotional abuse by his/her partner. After reading the trial summary, participants rendered a verdict and completed a questionnaire about their perception of the crime and the parties involved. Participants also completed measures of gender role beliefs and attitudes toward lesbians and gays. Our results suggest that such cases are perceived different in straight and same-sex relationships. Gender role beliefs, and attitudes toward lesbians and gays did not fully account for these differences.

Student: Ashley Ly

Faculty Sponsor: Jacqueline Bennett (Chemistry & Biochemistry)

Fluorescence of Solid-Phase Imines

This project is part of an on-going investigation into imines as possible fluorescent cell dyes. This research explores the natural fluorescence of our previously synthesized solid-phase imines, analyzed using a Perkin Elmer LS-55. Usually, the fluorescence of solid compounds is measured in solution. But, in previous experiments, we have witnessed color changes in imines when put into different solvents. This color change could obscure our measurements of fluorescence. Because of this, gathering data on solid-phase imines enables the collection of precise data not skewed by solvent-

influenced color changes. The results of the experiment will bring us closer to finding imines suitable for biological stains.

Student: Katherine Mahlum

Faculty Sponsor: Elizabeth Seale (Sociology)

Student Disability Service Policies through the Eyes of Faculty and Staff at SUNY Oneonta: A Diversity Critique

Today colleges and universities have the responsibility to give students with disabilities the opportunity to be a part of the college atmosphere along with fellow non-disabled peers, as the result of the 1973 section 504 Vocational Act and the 1990 Americans with Disabilities Act. SUNY Oneonta has a Student Disability Services (SDS) office to implement policies for students with disabilities. The purpose of this study is to find out how SDS policies are implemented by professors and the SDS staff. In this study three SDS staff members and ten professors at SUNY Oneonta were chosen through a random sampling process for semi-structured interviews about the Student Disability policies and the interactions between the professors and SDS staff. While reports were mostly positive, there was some confusion between professors and staff regarding the SDS policies. It is recommended that professors be granted more opportunity to be informed about SDS policies and that the campus community be educated on the importance of SDS policies for diversity on campus.

Students: Michael Marinello, Zachary Williamson

Faculty Sponsor: Vicky Lentz (Biology)

Development and Optimization of Largemouth Bass IgM Purification Using a Mouse Mannose-binding IgM Affinity Column

IgM, an isotype of the immunoglobulin family of molecules, is the largest, being a pentamer in mammals and a tetramer in fish. The tetramer in fish consists of four monomers that contain two identical heavy chains and two identical light chains. Due to the size and shape of the polymer, size exclusion chromatography is the best known method of purification. The problem with this method is that the yield of purified protein is not high. IgMs have a very narrow range of experimental conditions that keep the molecule intact. IgM denatures easier than the other isotypes. We wanted to modify a protocol that was made for purifying mouse IgM and adapt it for purifying the heavy and light chains of Largemouth Bass (*Micropterus salmoides*). For the purification steps we used a gravity Mannose-binding protein (MBP) affinity column designed for mouse IgM. A Nanodrop 1000 was used to measure the concentration of purified protein in the samples we collected. SDS-PAGE gel conditions were used to visualize the proteins that we purified. From our experiments we found that we are getting purified protein, but we are not sure if our final amounts are the maximum yield for the procedure.

Student: Anthony Marmet

Faculty Sponsors: Nancy Bachman, Jill Fielhaber (Biology)

Tagged HSF1 Isoforms as Tools for Tracking Heat Shock Components in Mouse Cells

Organisms must survive a variety of stressful conditions, including sudden temperature increases that damage important cellular structures and interfere with essential functions. Proteins activated in response to elevated temperatures are called heat shock proteins (hsps). Heat shock proteins bind to misfolded proteins to repair them, promoting survival. The main regulator of genes for hsps is called Heat Shock Transcription Factor 1 (HSF1). Humans, mice, and other vertebrates express four different types of HSF1, called isoforms, which differ structurally in the presence or absence of either of two short regions of 28 and 22 amino acids. We have constructed four sets of plasmids, which enable the individual mouse HSF1 isoforms to be expressed in tissue culture cells, with or without an activating deletion. Each set contains specific protein tags [either an octapeptide known as FLAG or a section of the flu virus "spiky" protein hemagglutinen (HA)] with one set tagged at the beginning (N-FLAG or N-HA) and another set tagged at the end (C-FLAG or C-HA) for each tag. The production of the tagged proteins was detected after transient transfection of NIH 3T3 cells via Western analysis.

Three of the four sets are complete or mostly complete as confirmed by binding of HA or FLAG primary antibodies and later reprobing with HSF1 primary antibodies. The confirmed sets of plasmid constructs comprise highly specific tools for investigating HSF1 function in mouse cells. Preliminary experiments have established conditions for detecting HA-tagged isoforms of HSF1 alpha and gamma in mouse NIH 3T3 cells by fluorescence microscopy. In the absence of heat shock, HA-tagged HSF1 gamma shows substantial staining in cell perimeters. This is further suggested by an experiment where the cytoskeletal protein beta-tubulin is colocalized with HSF1 gamma.

Student: Heather Matthews

Faculty Sponsor: Kjersti VanSlyke-Briggs (Secondary Education)

***Flight*: A Longitudinal Case Study to Prove Effectiveness of Novel Instruction for Student Participators During and After Methods**

Research, Theory and Practice in Middle and High School Education is the dividing line between an education major college student and a student teacher for all SUNY Oneonta secondary education students. Students in each content area takes a Methods class specific to his or her content area, as it prepares the pre-service teacher to create, teach and assess both unit and lesson plans. Arguably, the Methods experience is the most valuable class an adolescent education major could take. With this as my hypothesis, I set out to prove the impact of a specific novel being taught in Methods class having a positive effect on Methods participator effectiveness in my English education Methods class in Fall of 2013, with my peers as my participants. Using the novel *Flight*, by Sherman Alexie, we dove into the semester to teach and learn. The result of this study, which strove to prove the effectiveness of specific novel implementation during and after Methods class, was that if a student teacher is to use the same novel as both a student and a teacher (i.e., to use *Flight* in Methods as a reader and then to teach a lesson based on it), that the pre-service teacher candidate could be more effective, confident, efficacious and knowledgeable.

Student: Elli Mazeres

Faculty Sponsor: Sean Robinson (Biology)

Epiphytic Bryophyte Diversity: A Comparison Between Angiosperm and Gymnosperm Host Species

Epiphytic bryophytes are important in the ecology of forest communities for a number of reasons beginning with their ability to serve as sites for accumulation of water and minerals, of which has been shown to play an important role in the cycling of nutrients through certain ecosystems. They also provide food, shelter, and camouflage for many species of arthropods and even for a few larger organisms as well. Epiphytic bryophytes also serve an important role as biological indicators as the composition of the epiphytic community varies predictably with levels of pollutants. This study involves quantifying and comparing the biodiversity of epiphytic bryophyte species found on a wide range of host tree species. The main focus of the study was to compare bryophyte diversity between two host groups: gymnosperms and angiosperms. This study was conducted in Delaware County, New York at 37 field sites which were chosen using ArcGIS land cover data. Field work took place from May-October 2013. At each site, information was collected on forest community composition, light, height of each epiphyte on tree, and host tree species. After field work was complete, all collected bryophytes were identified and an analysis of diversity between the two host tree groups was completed.

Student: Melissa Minerva

Faculty Sponsor: Toke Knudsen (Mathematics, Computer Science & Statistics)

Origami in Math

Origami is commonly defined as the Japanese art of folding paper into decorative shapes and figures. In addition to origami being a form of art, it has many mathematical aspects to it as well. Origami has been used by mathematicians to prove various abstract concepts that wouldn't be possible to do on paper. This research explains the history of Origami, some of the Japanese mathematicians who

proved mathematical concepts and how they did so and, lastly, how Origami can be used in the everyday classroom to give students a better understanding of various topics in math.

Students: Armond Minor, Patsy Heisler

Faculty Sponsor: Allan Green (Chemistry & Biochemistry)

Mechanism of Curcumin Inhibition of Glucose Uptake

In this project we investigate the mechanism by which the compound Curcumin inhibits the transport of glucose across the cell membrane. Curcumin is a compound found in Turmeric, one of the spices used to flavor curry in Near-eastern cooking. Curcumin is the major yellow colored component of Turmeric, and has been used in traditional Indian medicine to improve digestion and circulation. Studies have suggested that it may have potential as a treatment for, or in prevention of, Type 2 Diabetes. Curcumin has been shown to inhibit the uptake of glucose across the cell membrane via the GLUT4 transporter, an insulin controlled transporter. The mechanism by which curcumin has these effects is not well understood. In this study we investigate what type of inhibitor curcumin is for the GLUT4 transporter. We used adipose tissue from Sprague-Dawley rats to investigate the inhibitory effects of curcumin by varying the concentration of the substrate (glucose) and measuring the uptake of glucose by the cells after incubation with curcumin. Determination of inhibitor type was done through analyzing the data on the uptake of glucose by the cells and applying the principles of Michaelis-Menton kinetics to the data. This was done by plotting the results using a double reciprocal graph of substrate concentration vs. velocity. In this way we determine the type of inhibitor curcumin acting, as in its inhibition of glucose transport across cell membrane in the cells.

Student: Natalia Montoya

Faculty Sponsor: Maria Cristina Montoya (Foreign Languages & Literatures)

Recovering Spanish as a Heritage Language in the College Classroom

It is estimated that by 2050, Hispanics will be the largest minority ethnic group, constituting twenty-five percent of the total population in the United States (Day, 1996). Although this growth exponentially continues today, the Hispanic population predicted by these calculations does not necessarily correspond to a parallel growth of Spanish speakers in the United States. Studies reveal that by the third generation, Spanish is lost (Bills 2005, Chávez 1988, González y Wheritt 1990, Hidalgo 1993, Rivera-Mills 2000b). Over a course of a semester, I was able to understand and analyze Spanish native and heritage speakers' linguistic needs and identity processes through a writing project of autobiographies. I depicted this through common language mistakes, lack of vocabulary and the use of "Spanglish" (code-switching) reflected in their classroom work and oral presentations. My compilation of research focuses on the theory behind heritage language maintenance and shift, as well as displacement and loss, influenced by factors such as linguistic ideologies, motivations, sociolinguistics factors, and U.S. linguistic policies.

Student: Myles Moore

Faculty Sponsor: Leslie Hasbargen (Earth & Atmospheric Sciences)

Groundwater Flow and Geochemistry at Greenwoods Preserve, Central New York

This study attempts to link groundwater geochemistry to shallow (<50 m depth) flow paths and surface waters in a case study in central upstate New York. We measured elemental water chemistry and bulk parameters (total dissolved solids, electrical conductivity, salinity, temperature and pH) in various water body types (lake, stream, and well) in an upland region over an aerial extent of about 5 square km. The project area is underlain by Devonian sedimentary units, namely the Moscow formation overlying the Panther Mountain formation which, in turn, overlies the Marcellus shale formation. We tested the following hypotheses: Does groundwater rise from a deeper aquifer along a regional fracture? How well do elemental concentrations in groundwater reflect underlying geology? Can water body type be inferred solely from elemental concentrations and/or bulk parameters? We sampled water in five hand-dug shallow wells, three deeper drilled wells, two bog locations and several streams repeatedly from May 2013 to November 2013. Fifty to 60 elements were analyzed

including major, minor trace and rare earth elements. Elemental concentrations were determined using inductively coupled plasma-mass spectroscopy (ICP/MS) and chemical titrations. We mapped fracture patterns in bedrock exposures. While good evidence exists that a major bog lies along a regional fracture, we find no clear evidence that groundwater rises from a deeper aquifer to shallower aquifer in our study area. We do find that elemental concentrations in groundwater samples reflect underlying geology, and that total dissolved solids vary systematically by water body type: bog is the lowest, followed by shallow wells, lakes, streams, and deep drilled wells, in order of increasing concentration. There is, however, significant variation in geochemical fingerprints between wells, suggesting that locally, water-rock reactions along groundwater flow paths develop a characteristic suite of dissolved elements. Surface water bodies are more similar to shallow (<10 m) wells than deeper wells (~47 m deep).

Students: Myles Moore, Colleen Parker, David Snyder

Faculty Sponsors: Devin Castendyk, Oluyinka Oyewumi (Earth & Atmostpheric Sciences)

Geochemical Assessment of Stream Sediments along Susquehanna Estuary System

This project examined the impact of land use on the chemical signature of trace and heavy elements (Cu, Pb, Zn and Ni) in stream sediments within the Susquehanna estuary system, Otsego County, New York. Eleven sediment samples were collected from the Susquehanna drainage system and analyzed for acid and soluble extractable elements, and basic soil parameters (organic matter, cation exchange capacity [CEC] and soluble salts). When the concentration of elements is graphed on a logarithmic x and y axis the results are normally distributed. Concentration of elements demonstrated spatial variability in stream sediments with a decreasing order of abundance: Zn>Pb>Cu>Ni. Most of the element concentrations increase from upstream to downstream where there is a larger volume and possible longer contact time between the elements in solution and sediments. All positive correlation analysis among elements is suggestive of similar source. Further studies will focus on the concentrations of these elements in aquatic animals to determine possible impact on the ecosystem.

Student: Annie Murphy

Faculty Sponsor: Florian Reyda (Biology & Biological Field Station)

A Survey of the Digenetic Trematodes of Amphibians at Thayer Farm, Biological Field Station

This study is a preliminary survey of digenetic trematodes that parasitize amphibians (e.g. frogs, toads and salamanders) in Otsego County, New York. Students in Parasitology and Invertebrate Zoology classes have repeatedly visited Thayer Farm at the SUNY Oneonta Biological Field Station in recent years to conduct basic biodiversity surveys and exercises. Frogs and salamanders have been obtained as part of this endeavor, and have been subsequently examined for parasitic worms. One group of worms that was especially abundant in these hosts was the digenetic trematodes. For example, the Green frog (*Rana pipiens*) was parasitized by at least 2 different genera of digenetic trematode, at least one species of *Haematoloechus* in the lungs, and a species of *Megalodiscus* in the rectum. Spring Peepers (*Pseudacris crucifer*) were also examined, revealing a single species of digenetic trematode in the intestine. The red-backed salamander (*Plethodon cinereus*) was also parasitized by a species of digenetic trematode in the intestine. At present, there are ongoing efforts to identify to species these and other digenes from their amphibian hosts.

Student: Seamus Murray

Faculty Sponsor: Heike Geisler (Chemistry & Biochemistry)

Graphene Growth Studies on Copper (111) and Silicon Carbide Substrates

Graphene shows great promise for use in a variety of technical applications, but the production of large area graphene is still a challenge. In this study we will show the two most promising substrates on which to grow high-quality graphene, silicon carbide (SiC) and Cu(111) surface. The difference between the two substrates is that, with the use of SiC, multiple over-layers of graphene were observed as opposed to the single layer of graphene grown on Cu(111) surface. With Low Energy Electron Diffraction (LEED) the SiC gave a Moire pattern in the spectra observed, which confirmed

the growth of multiple layers of graphene. On Cu(111), depending on the coverage, single layer graphene is either aligned with the substrate or adsorbed in rotational disorder.

Student: Adam Myer

Faculty Sponsors: Fred Zalatan, Tami LaPilusa, David Wong (Biology)

Identification of Bacteria in Otsego Lake Using DNA sequencing Technology

Water samples were collected from various locations in Otsego Lake, NY. Using standard recombinant DNA techniques, such as Polymerase Chain Reaction (PCR) and DNA cloning, bacterial DNA was isolated and extracted from the samples. The DNA will then be sequenced. This type of sequencing is known as environmental sequencing, which is the retrieval of genetic information from environmental samples. This sampling also allows for the characterization of bacteria without having to grow them in a laboratory setting. This is part of a larger field known as Metagenomics, which has become increasingly more popular within the last decade due to the large variety of research applications. Such applications include the human gastrointestinal tract and pathogen function. Bioinformatics databases that contain DNA sequence maps of various genomes will be used to help identify the specific species of bacteria present. Further analysis will also be conducted to investigate the protein coding regions of the bacteria and how these bacteria interact within their ecosystem.

Students: Samantha Myruski, Jounia Sara Saint-Juste

Faculty Sponsor: Nancy Bachman (Biology)

Role of Mouse Heat Shock Transcription Factor Isoforms in Metal Ion Stress Pathways

The ability to handle low levels of environmental stressors is a key adaptive capacity of living things. Heat shock transcription factor 1 (HSF1) is the main regulator of stress pathways in response to heat, peroxide, and heavy metals such as cadium and zinc ion. The goal of this project was to identify levels of metal ions that would induce a stress response, then test whether *Hsf1* isoform messenger RNAs vary in response to metal ion treatment. Growth bioassays were carried out by treating NIH 3T3 cells in separate wells with different concentrations of cadmium sulfate (0-60µM) or zinc sulfate (0-640µM), surviving cells were identified using luminescence. Once appropriate treatment conditions were established, total RNA was isolated from treated and untreated cells, and complementary DNA was synthesized. To compare levels of expression, we are using specific primer sets to amplify the individual isoforms (*Hsf1* alpha, beta, gamma, or delta) using PCR. The PCR products are then being analyzed by agarose gel electrophoresis. Somewhat surprisingly, the results seen for *Hsf1* alpha were quite complex, multiple products were detected in the absence of zinc and in the absence of cadmium, these declined as zinc levels decreased but stayed nearly the same as cadmium levels decreased. Levels of *Hsf1* gamma showed little fluctuation, however, some larger products were produced that have yet to be characterized. These experiments have established conditions for studying the role of heat shock factor 1 in metal stress response pathways in a mouse cell culture model system.

Students: Alexandra Nicolette, Brandon Benedict, Izabela Szlejter

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Okra Gum Fat Replacement in Chocolate Ice Cream

The traditional ice cream recipe is high in saturated fat. Our experiment was aimed at lowering the saturated fat content of chocolate ice cream. We made samples containing 25%, 50%, and 75% less saturated fat than the 100% fat version of the traditional ice cream sample in order to lower the saturated fat content. In the lower fat samples a powdered skim milk was utilized to lower the overall saturated fat content. In these samples okra gum was added to offset the unappealing color, smell, texture, flavor, aftertaste, and overall acceptability that normally results from lower fat ice cream recipes. The end results that were comparable were the 25% and 50% okra gum fat replacement groups. The 25% okra gum fat replacement scored consistently in the acceptable range of a hedonic scale rating color, smell, texture, aftertaste, overall taste, and overall acceptability. The 50% okra gum fat replacement scored lower than the 50% and control groups, but was overall acceptable with a

rating of three out of five in the overall acceptability category. Our research has indicated that utilizing okra gum as a fat replacement in ice cream can be successful in smaller amounts.

Students: Amanda Orsino, Melissa Minerva

Faculty Sponsors: Toke Knudsen (Mathematics, Computer Science & Statistics), Heather Beach (Milne Library)

Collections of American Mathematics Textbooks

In this project, we are researching collections of American mathematical textbooks at various colleges in the United States, including visiting the collections at Cornell University (Ithaca, NY) and Teacher's College, Columbia University (New York, NY). We are investigating how the collections of textbooks are used within the college community, who is using the collections, and the availability of these textbooks. We are also researching how the collections were established. Questions include whether the institutions have applied for grants, if the books were donated, and whether the collections were built up slowly over time or purchased all at once. We will use our results to propose a plan for the future use of the American mathematics textbook collection at SUNY Oneonta.

Students: Victoria Panyu, Jaewon Bang

Faculty Sponsor: Hyejune Park (Human Ecology)

The Second Generation of E-commerce: Online-only Apparel Retailers' E-tailing Strategies

Online apparel retailing has transformed immensely over the past decade, forever changing the relationship between customer and retail. This study focused on online-only fashion retailers and its components. This research project aimed to uncover e-retailers key factors that go into gaining both profit and customer loyalty. This research was done through content analysis. By studying 10 online retailers and their detailed features, we were able to code the information and then examine the results. The findings from this research show that online retailers strive to shorten the gap between a customer's purchase and their uncertainty from the inability to physically examine a product. It also shows that these retailers try to make customers' shopping experiences as clear and as easy as possible, with exceptional sorting categories and search options. The biggest transformations in online retailing are social networking and interactivity. Connecting customers to a company's clothing through social media and engaging interactions has, and will continue to, increase. As a result of the findings of the work, it has become obvious that the online-retailing world still needs improvement. Though there have been many advances, it still lacks important features, such as the Country of Origin and "Imported" transparency.

Student: Shane Pickering

Faculty Sponsors: David Wong, Paul Lord (Biology)

Effects of Environmental Variables on the Maturation and Spawning of Zebra Mussel (*Dressena polymorpha*) in Otsego Lake, NY

Zebra mussels are an invasive mollusks that were unintentionally introduced to North American in the 1980's. Zebra mussels reached Otsego Lake sometime in the early 2000's and were positively identified in Otsego Lake in 2007. The goals of this study are 1) to determine if zebra mussel populations at different depths in Otsego Lake mature/spawn synchronously or at different times and 2) are there any environmental variables that correlate strongly with the initiation of zebra mussel maturation/spawning events in Otsego Lake. This study will take place from March 2014-November 2014 at Five Miles Point on Otsego Lake NYS. Zebra mussels will be collected from hard substrate at 5 meters and 12 meters and returned to the surface for analysis. A maturity index will be developed from the zebra mussels collected and veligers (young) will be collected from the water column at 5 meters and 12 meters to validate the maturity indices generated from histological analysis of adult zebra mussels. Dissolved oxygen, temperature, turbidity, conductivity, calcium and chlorophyll-a will be measured and reviewed to see if a correlation exists between these variables and the initiation of maturation/spawning of zebra mussels in Otsego Lake.

Student: Christine Picucci

Faculty Sponsor: Jeffrey Heilveil (Biology)

Phylogeography and the Development of Microsatellite Primers for *Acroneuria carolinensis* (Banks) (Plecoptera: Perlidae)

Acroneuria carolinensis (Banks) (Plecoptera: Perlidae) is a predatory stonefly found east of the Rocky mountains in freshwater streams. This organism is sensitive to environmental changes and relies on highly oxygenated streams to survive, making it an ideal subject to study negative anthropogenic effects. Through the use of population genetic analyses and polymorphic molecular markers, such as microsatellites, we can begin to answer several important ecological questions. Using the microsatellites we developed, this project intends to determine the historical northward migrations in New York State of *A. carolinensis* after the last glacial retreat.

Students: Ashley Pospisil, Andrew Grenci

Faculty Sponsors: Fred Zalatan, Tami LaPilusa (Biology)

Seasonal Variation of Bacteria in Otsego Lake

Water samples were taken from Otsego Lake in order analyze bacterial species present during various seasons of 2011. DNA was extracted and isolated from the samples. A segment of interest was amplified via the Polymerase Chain Reaction (PCR). PCR products were then run on agarose gel to ensure successful amplification of the desired sequence. The bands were cut from the gel, and DNA was resuspended and inserted into plasmids to be taken up by competent cells. After extraction of the DNA insert, sequencing will be performed. This technique of environmental sequencing allows for identification of bacteria without culturing.

Students: Brooke Ramage, Hannah Wightman, Brittani Woods

Faculty Sponsor: Elizabeth Seale (Sociology)

Child Protective Services, Mental Health, and Substance Abuse in Low-Income Families

The Family Planning Education Services Project is meant to discover more information about the low-income families or participants and how it is, or is not, helping them. Through Family Planning, word of mouth and flyers, we are able to contact potential participants and set up times to conduct interviews. These interviews contain questions about how the services are working for them, as well as questions about their family lives; personal questions about their sex lives, substance abuse, work, education and, oftentimes, mental health is brought up. We decided to take these interviews and find out how Child Protective Services (CPS) mental health, and substance abuse, affect low income families. As we coded these interviews we learned how mental health may affect CPS involvement in their affairs, or all three of these factors are intertwined in their lives. Along with the interviews, our study also included researching articles that went along with our particular questions, and what we were looking for.

Student: Max Reinhold

Faculty Sponsor: James Ryder (Mathematics, Computer Science & Statistics)

Cryptographic Libraries

Computers have allowed humanity to make astounding advancements in a wide variety of fields. One such field is cryptology. A computer's ability to make thousands of calculations per second allows us to use more advanced cryptographic algorithms. I studied cryptographic algorithms and created software library files to encode and decode data using cryptographic algorithms. In order to study cryptographic algorithms, I started by coding several basic ciphers. These include the substitution cipher, transposition cipher, and Vigenere cipher. Once I became comfortable with the basics, I moved on to more modern cryptographic algorithms. These include, RSA, Diffie-Hellman key exchange, and the Lucifer Cipher. I focused on coding these algorithms so that minimal knowledge would be required to make use of the libraries. Simply being able to call one function to encode and one to decode is necessary. I managed to code five successful encode and decode functions. During

coding and testing of even the most basic functions, it was clearly shown that computers make the processes of encoding and decoding significantly quicker and easier. Where a human can make mistakes that render something completely unreadable, running the routines with a computer eliminates the possibility of error in encoding and decoding messages.

Students: Hanna Riccio, Jacquelyn Karkos, Elizabeth Krein, Ashly Hemstreet

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Using Pear Puree as a Fat Mimetic in Cookies

Obesity is a health problem that is increasing in the United States. Consuming foods that contain a low amount of fat may help to reduce this health concern. The purpose of this experiment was to determine the acceptability of using pear puree as a substitute for butter in the production of white chocolate chip cookies in order to reduce the amount of fat that the product contains. A nutrient analysis of the samples was also evaluated. Pear puree was substituted for 25%, 50%, and 75% of the butter fat that is found in white chocolate chip cookies. Sensory characteristics including: color, odor, taste, texture, and overall acceptability were evaluated by a group of thirty consumers using a hedonic scale. Sample A, which consisted of 75% butter fat and 25% pear puree, ranked highest in texture, odor, taste, and overall acceptability. Sample B, 50% butter fat and 50% pear puree, ranked highest in odor. Sample C, 100% butter fat, ranked highest in color. After nutrient analysis, Sample D, 75% pear puree and 25% butter fat, contained the least amount of calories, calories from fat, total fat, saturated fat, and cholesterol. This implies that pear puree may enhance the nutritional quality of white chocolate chip cookies. This study illustrates that pear puree is an overall acceptable substitution for butter in the preparation of white chocolate chip cookies and may be conducive to a healthier, lower-fat diet if consumed more often.

Student: Roxanne Rippa

Faculty Sponsor: Gayane Torosyan (Communication Arts)

Marriage Ritual in Pupi Avati's Motion Picture "The Best Man"

Using semiotic analysis as qualitative methodology, this study examines a motion picture by Pupi Avati titled "The Best Man" (Il Testimono dello Sposo's) for its presentation of marriage and its rituals within a feminist postmodern critique. The study examines the representation of cultural rituals performed in late 19th century Italy and compares them with contemporary wedding traditions. Marriage traditions examined in the study include social spending, gift giving, and symbolic representations of love within matrimony.

Students: Marvin Rodriguez, Anthony Nichols

Faculty Sponsor: Sen Zhang (Mathematics, Computer Science & Statistics)

Assembling and Using a Parallel Computing Cluster System

The project involves the assembly of a portable, low-cost, yet fully functional parallel computing platform called Little-Fe, use of the Bootable Cluster CD (BCCD), and exploration of different parallel programming environments. The platform is a Beowulf style portable computational cluster consisting of three dual core motherboards connected via an Asus gigabit network switch. One of the three nodes serves as the head node, while two serve as worker nodes. Software components include a BCCD that is run from a Seagate 2.5 SATA Hard Drive 160GB attached to the head node. The BCCD provides an operating system environment to explore computing concepts such as speedup, scalability, efficiency, and load balancing, which are supported more effectively on a parallel platform than on a single machine. The resulting system provides us a setting to explore shared memory parallelism Open Multi-Processing (OpenMP), distributed memory parallelism Message passing Interface (MPI), Open MPI, and General-purpose computing on graphics processing units GPGPU parallelism (CUDA). Several classical parallel algorithms of basic computing problems were tested to compare with their sequential implementations. Future work includes exploring the performance of adding extra nodes as well as the further investigation of parallel applications and implementations of more advanced problems.

Students: Alejandro Rojas, Audrey Feirstein, William Helicher

Faculty Sponsor: Ho Hon Leung (Sociology)

Student Perception of Traveling and Studying Abroad

We are living in a diverse and global world where it is important to be educated so that we know how to interact and work with our fellow neighbors. In order for students to prepare to adapt into this globalized world, there are many ways to obtain awareness through formal and informal networks. The College offers a variety of means to obtain this, such as databases, classes and, arguably the most important, faculty-led overseas courses and study abroad opportunities. Although these are very important to diversity and global connectedness, we have a low participation in these programs and, when they are taken advantage of, students are choosing more familiar European countries. From surveys we conducted last semester we have found that students prefer to travel to locations they are more familiar with, such as where they have ancestral ties. We also found that students hold prejudice against unfamiliar cultures. These results could suggest reasons for low numbers of students traveling to non-European countries. Based on these findings more needs to be done to encourage students to participate in these programs, such as increasing promotion and scholarships as well as an easier means of transferring credits between unaffiliated colleges.

Student: Ariel Rosero

Faculty Sponsor: Dona Siregar (Economics, Finance & Accounting)

Spending Rules and Endowment Value

College endowments play an integral role in providing financial support to academic institutions. In recent years, however, government officials have noticed that many endowments have grown substantially in value due to their overall good returns. This has led some officials to propose that institutions pay a mandated payout rate of at least five percent. This mandated rate, in their point of view, is to encourage endowments to spend more of their funds to assist prospective students with their financial needs. In additions, college institutions can benefit from these payouts by using some of the funds to fund future projects and maintain current scholastic programs. This project aims to examine: under the median average, the banded inflation, and the year-end rule, which of these spending rules maximizes spending and maintains endowment value over time? Answers to this question may help endowments determine better spending policies.

Student: Michelle Rotunno

Faculty Sponsor: Elizabeth Seale (Sociology)

How is Social Media Affecting Us?

Social media is a fairly new concept, yet already widely used and accepted. Social media websites are most often used by young adults and adolescents. Our society today has become very integrated with technology, and the younger generations have grown up with the internet and are accustomed to using social media sites such as, Facebook, Twitter, Instagram, and many more. Many individuals who use social media are unaware of the negative effects it can have on their mental health. The purpose of my study is to discover the negative effects that social media has on college students' mental health. A positive correlation between social media usage and negative effects on mental health is predicted. Participants were obtained through convenience sampling. Participants responded to an online survey and were compensated for their time. As of March 5th results are yet to be analyzed.

Students: Jessica Rudolph, Alexa Zajac, Caitlin Coogan

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Acceptability of Great Northern White Beans as a Fat Substitute in Oatmeal Chocolate Chip Cookies

The average American diet is usually high in fat. As consumers have attempted to reduce the amount of fat they eat, there is an increased demand in reduced-fat foods. The purpose of this study was to determine the overall acceptability of oatmeal chocolate chip cookies prepared using pureed Northern white beans as a fat ingredient substitute. Pureed Northern white beans were substituted for 25%,

50% and 75% of the fat in oatmeal chocolate chip cookies. Thirty college student and our foods professor participated in a five-question survey following sampling. The results concluded the main effect of bean substitution was statistically significant for the acceptability in all the categories. There were no significant differences in the results between the three tasting sessions. The study shows that it is possible to substitute pureed white beans for fat in oatmeal chocolate chip cookies at a level that results in an acceptable product.

Students: Cory Rusin, Zachary Horowitz

Faculty Sponsor: Michael Brown (Psychology)

Cognitive Components of Health Anxiety

This study examines how rational and experiential information processing is related to health anxiety. The cognitive-experiential self theory (e.g. Epstein, 1990) states that cognitive processing consists of two distinct, but parallel, systems: a rational system and an experiential (or intuitive) system. Health anxiety, which involves an excessive preoccupation with having a serious illness, may be a result of a conflict between these two processing systems. People with health anxiety may be engaging too heavily in rational processing by connecting vague or unspecified symptoms to conclude that they are suffering from a particular disease. On the other hand, people with health anxiety may also be engaging too heavily in experiential processing by attending to their symptoms and intuitive feeling that there is something seriously wrong with them. Participants completed a risk assessment task, a rational-experiential survey, and a series of mental health questionnaires – including a health anxiety index. Our findings may be useful in identifying the underlying thought processes that are related to health anxiety and in developing better treatment approaches.

Student: Julia Russell

Faculty Sponsor: Dawn Hamlin (Educational Psychology, Counseling & Special Education)

Movie Mash Up: The Portrayal of Disabilities in Movies

Media plays a large part of our daily life and includes cell phones, different technology, and even the increasing amount of film and television. Society has become much more accepting of disabilities over the past few years, but media still displays this reoccurring battle. This reoccurring battle is the display of people with disabilities in media. This topic is very controversial and causes a range of emotions from viewers. For this presentation, the project team analyzed movies in the movie ratings of PG13 and above along with PG and below. Media displays people with disabilities both negatively and positively in films and in movies. Some films have the character overcoming the disability and not seeing the disability as a hindrance. In other films, the disability can be seen as an obstacle with other characters mistreating him/her due to the disability. Since media is a large part of society today, educating individuals on the negative and positive portrayals of people with disabilities in films is crucial. When viewing certain films one may not realize the disabilities present or that the film may be portraying the characters negatively. This presentation presents viewers with a realization that media can be a positive or negative influence, and hopes to make viewers more aware and accepting of all disabilities, not only in society but in film as well.

Student: Joanna Salvino

Faculty Sponsor: Jeffrey Heilveil (Biology)

The Indirect Effects of Urbanization on New York Populations of *Nigronia serricornis* (Say) (Megaloptera: Corydalidae)

Fine-scale interactions within a species promote broad-scale population health by allowing for adaptation in changing environments. The geography of a region dictates the movement and interaction of natural populations. Movement of organisms can be impeded by the physical features of the land. Altered landscapes as a result of anthropogenic development may inhibit physical interactions among organisms. *Nigronia serricornis* (Say), the saw-combed fishfly, is an organism that is very sensitive to environmental change. This insect dwells in 2nd and 3rd order streams and is an indicator species of high water quality and oxygen content. This project is comparing genotypes of

N. serricornis larvae collected from urbanized areas with genotypes of *N. serricornis* larvae collected from forested areas in order to examine the effect of urbanization on these aquatic insects.

Students: Rachel Schappert, Kaitlyn Alongi, Tegan Mansouri

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

The Overall Acceptability of Greek Yogurt as a Fat Replacer in Cheesecake

Cheesecake is a very popular dessert amongst Americans because of its rich and creamy taste. Cheesecakes bought in stores are now made to go from the freezer to the refrigerator with no hassle for the consumer. Unfortunately, almost sixty percent of the calories in cheesecake come from fat. The typical cheesecake has 578.5 calories per serving, with 349 of those calories coming from fat. Yogurt is nutritionally rich in protein, calcium, riboflavin, vitamin B6 and vitamin B12. It has nutritional benefits beyond those of milk. People who are moderately lactose-intolerant can consume yogurt without ill effect, and the consumption of low-fat yogurt can promote weight loss, especially due to the calcium in the yogurt. Non-fat Greek yogurt will be substituted for 40% and 50% of cream cheese in the cheesecake recipe to compare to the traditional cheesecake (0% replacement). A self-administered sensory evaluation will be conducted to rate each product for six attributes including appearance, color, taste, texture, smell and overall acceptability. In addition, the participants will also be asked to rate the six attributes as to how important they are. The results will be analyzed and presented.

Student: Kevin Schermerhorn

Faculty Sponsor: Jeffrey Heilveil (Biology)

Estimating Prevalence of Borrelia in the Ticks of Otsego County

Lyme disease has been declared the most common vector borne disease in the United States by the Center for Disease Control. The bacterium, *Borrelia burgdorferi*, that causes the disease is transmitted by the blacklegged (or deer) tick, *Ixodes scapularis*. *Borrelia* infected ticks are locally occurring, exposing humans in Otsego County to infection. This study is aimed at determining the prevalence of *Borrelia* infection within the local tick population. Collection of ticks via cloth drags at four sites in Otsego County between May 2013 and November 2013 produced only 46 ticks due to prohibitive weather. Donated ticks harvested from persons or animals of college faculty and staff produced 158 ticks. Dissection of tick gut and salivary glands were made into slides for examination via dark field microscopy. *Borrelia* was discovered in 59 ticks, 2 ticks from drag sites and 57 from donated ticks. Once temperatures rise enough to melt snow and allow the ticks to emerge from the leaf litter, collection via drag sheet will continue. Statistical test will be run to determine overall prevalence, prevalence by sex, and prevalence by season.

Students: Kevin Schermerhorn, Christine Picucci

Faculty Sponsors: Jeffrey Heilveil, Jennifer Withington (Biology)

Collection and Rearing of Forensically Important *Phormia regina*

Forensic entomology is the study of insects and related arthropods involved in legal matters. The most recognizable subfield of forensic entomology is the medico-criminal specialty. This field includes the study of arthropod activity involving human remains. Television shows popularize homicide investigations, but forensic entomologists also investigate problems with stored products like grains, complaints with restaurants involving insects, and urban pest problems. Medico-criminal entomology is used by law enforcement agents to help determine how the victim died, location of death, and most importantly, the time of death. Forensic entomologists aid law enforcement by determining a Post-Mortem Interval (PMI) via faunal succession around or within the body. This study was focused on collecting insect decomposers common to animal remains in the area with hopes of rearing them through their lifecycle in order to observe all life stages. *Phormia regina*, the black blow fly, was the only insect to colonize a beef liver trap used for collection. Multiple adults visited the trap, depositing hundreds of eggs. First through third instar larvae were collected, as well as pupae, however, second generation adults never emerged.

Student: Carol Scheuerer

Faculty Sponsor: Toke Knudsen (Mathematics, Computer Science & Statistics)

Plato and His Academy

Plato is notably considered to be one of the most famous philosophers who made a plethora of contributions in the fields of mathematics and the sciences, reforming the way in which people viewed the physical world. Plato's Academy was the center of intellectual development and the branches of study included arithmetic, geometry, stereometry, and astronomy. The Academy fostered learning in Athens during the Classical Greek era, as it held knowledge to a high prestige and valued its importance. Without the emphasis placed on education and Plato's role as a facilitator of learning, the development of mathematics and the sciences would have certainly been delayed.

Student: Sara Schleissmann

Faculty Sponsor: Laura Munteanu (Mathematics, Computer Science & Statistics)

Compositions of Linear Transformations and Their Fixed Points

Linear transformations form an essential chapter in the landscape of mathematical studies. In the study of linear transformations, understanding the set of their fixed points sheds light onto some of their properties. In particular, for isometries, which are special linear transformations, investigating the set of fixed points leads to the classification of isometries. In this presentation, we examined fixed points from an algebraic as well as geometric point of view. We also consider compositions of linear transformations and discuss how translations and rotations can be seen as compositions of reflections.

Student: Kate Schultz

Faculty Sponsor: Fred Zalatan (Biology)

Fatty Acid Uptake in Bacteria

Fatty acids support many cellular functions in all organisms, including bacteria. Since fatty acids are vital to sustaining life, disrupting the way bacteria consume these molecules may help fight infections in the future. Research methods to disrupt uptake include screening various compounds that may inhibit the fatty acid uptake and disrupting the gene responsible for this process, rendering it non-functional. These experiments will be performed on two different species of bacteria, E. coli and C. crescentus. E. coli is a well-studied organism that undergoes simple binary fission, while C. crescentus undergoes differentiation during cell division.

Students: Lauren Shore, Emily Moore, Audrey Slezak

Faculty Sponsor: Allan Green (Chemistry & Biochemistry)

Effects of Curcumin on Glucose Uptake and Lactate Release of Rat Adipocytes at Different Glucose Concentrations

Our previous study (presented at the 2012 SRCA Day) demonstrated the ability of curcumin to inhibit insulin-stimulated glycolysis in rat adipocytes (in vitro). Curcumin is a chemical found in turmeric that has been shown to have pharmacological effects. Our previous experiment measured the effect of curcumin on insulin-stimulated glycolysis, which led to further questions. We demonstrated that insulin is required to take up glucose and produce measurable quantities of lactate. Our current interest is in determining whether curcumin acts as a competitive inhibitor of glucose uptake in fat cells. To do so, we need to use much lower concentrations of glucose to observe the proposed relationship. Since our previous work used higher concentrations of glucose, we will be repeating our experiment at lower concentrations and interpreting the results of our lactate assay. A challenge of this study will be measuring the lactate production at such low concentrations through spectroscopy.

Student: Bonnie Siry

Faculty Sponsor: Elizabeth Seale (Sociology)

Tweeting on Women's Health

This project examines how women's health issues are portrayed and discussed on the social media site Twitter. Twitter is a very popular source of social media that reaches a large demographic audience. Specifically, the project will explore how Twitter account users interact with women and their health. Through this qualitative research I seek to answer the following questions: How is women's fitness/health portrayed in the media? (Is there a greater focus in the media on thinness than on healthiness for women? What messages are being sent out to women about their health?); and, What does Twitter think will motivate women to be healthy? (How do women feel about themselves and what do they do to be healthy?). This research focuses on how Twitter accounts portray the healthy woman and healthy habits. Hashtags and Twitter Accounts are used to find the tweets that are relevant to women's health. I developed three frames through the coding of tweets that include different ways of looking at women's health. My findings look at how tweeting is used to share and strengthen views on different aspects of women's health.

Students: Jennifer Sosiewicz, John Zdimal, James White

Faculty Sponsor: Jen-Ting Wang (Mathematics, Computer Science & Statistics)

Sustainability, Surveys, and Statistics: Recycling at SUNY Oneonta

Each year on average, Americans throw away enough paper and plastic to circle the equator 300 times, and an office worker uses about 500 disposable cups. With such immense numbers, we decided to see what the statistics are at our own college (a fairly concentrated campus). The purpose of this study is to gather information about recycling habits and opinions in order to improve our campus community. In order to obtain a representative sample without generating waste, we created an online survey and distributed it to a calculated stratified random sample of students and faculty/staff on our campus. In this study, we report the percentage of people who actually recycle, what is being recycled most, and what items should be minimized. The comparisons of recycling habits between students and faculty/staff are also reported. Moreover, to help our campus to become more sustainable, we explore what would bring more recycling to our campus and what would be the most effective method for advocating recycling.

Student: Caitlin Stroosnyder

Faculty Sponsors: Willard Harman (Biological Field Station), David Wong, Kiyoko Yokota (Biology)

Goodyear Lake, Otsego County, NY, Management Plan

Goodyear Lake in Otsego County, New York, was formed in 1907 by flooding the Susquehanna River Valley with the construction of Collier's Dam. Its water supply originates from the River and three smaller tributaries, Red, Oaks and Cherry Valley Creeks. Goodyear has a 352 sq. mile watershed, which is large relative to its 365-acre surface area and maximum depth of 12 meters. It is a dimictic lake. Trophic status parameters including total phosphorus > 20 µg/l, chlorophyll *a* > 8 µg/l and Secchi disk transparency < 2 meters indicate eutrophication. Poor oxygen levels, 0-4 mg/l, in the summer hypolimnion also signify the lake is productive. A September 2013 electrofishing investigation revealed a healthy fishery and included species such as Largemouth Bass, Walleye and Yellow Perch. According to an April 2013 public opinion survey the top three concerns of lakeside residents are: the condition of the Dam, algae and weed growth, and loss of fish and wildlife. My research is focused on the development of a science-based lake and watershed management plan for the Goodyear Lake Association. It will include initial implementation of the plan to address short-term goals and the future ecological sustainable functioning of the Lake.

Student: Tiffany Squire

Faculty Sponsor: Charlene Christie (Psychology)

Hookups, Shame and Gender

This descriptive study aimed to identify variables that play a role in the hookup culture of SUNY Oneonta's students. The sample included 57 students (16 male, 40 female, 1 no response). An online survey was employed for gathering data. The information gathered included demographic information (gender, age, and sexual orientation). Participants were asked to describe a recent hookup using guiding questions to determine, for example, where they met, the use of drugs, and whether or not it was their first time involved in a hookup. Additional questions to identify emotions associated with hooking up were established. It was predicted that drug use would be a very prevalent factor in college hook ups. The prediction was supported by the data, with alcohol proving to be widely used by 52.6 percent of our sample. No conclusions can be drawn from the data; however, it does provide us with insight.

Student: Nicholas Tantillo

Faculty Sponsor: Betty Wambui (Africana & Latino Studies / Women's & Gender Studies)

Power Struggle Between Matriarchy and Patriarchy in the Portrayal of Vodou in Western Television

This project utilizes post-colonial theory to deconstruct the "Vodou Priest/Priestess" image common to Western television. The goal of this deconstruction is to address the power struggle inherent both historically and theoretically between Vodou and a patriarchal culture. Finally, the goal is also to emphasize the image's implication in discrediting Vodou and its practitioners as a viable source of magical/scientific knowledge. This study touches upon Linda Gordon's essay *Magic*, and it's comparison of magic and science in a historical context. I have chosen this essay due to my interest in post-colonial studies and the relationship between magic and science. I am also interested in addressing the Vodou Priest/Priestess image as an image of power, and its opposition to a patriarchal power structure.

Students: Christina Vavro, Kenneth Graniero

Faculty Sponsor: Shih-Ming Hu (Human Ecology)

Development of Low Fat Chocolate Chip Muffins

As a product, muffins typically contain a high amount of calories in the form of fat. The object of our study was to reduce the overall calories from fat in muffins while still preserving the overall acceptability of muffins as a product. In our experiment, the most acceptable products of the control, 50% replacement, 75% replacement, and 100% replacement, as suggested by the evidence in the study, was the 100% replacement of fat group, which had rated highest in overall acceptability over the four groups. Our conclusion, as supported by the data, has suggested that cauliflower can be used as an acceptable fat replacer in muffins and preserves overall acceptability as well as flavor, texture, moisture and taste in the brownies produced.

Students: Lauren Warren, Alexandra Muraca

Faculty Sponsor: Rebecca Harrington (Student Health Services)

Blame the Red Cup: Lessons from Negative Experiences with Alcohol at SUNY Oneonta

In the spring of 2014 residential students at SUNY Oneonta were handed a red Solo cup and a sharpie and asked to write about a negative outcome that they had personally experienced as a result of alcohol. The goal was to obtain a realistic viewpoint of experiences of SUNY Oneonta students to utilize in further prevention education programming. More than 600 cups were collected and categorized with experiences that included medical transport, sexual assault, public urination, vomiting and regrettable choices.

Student: Jessica Williams

Faculty Sponsors: Nancy Bachman, Kel Lee Hassman (Staff Sponsor)

Subcellular Localization of Heat Shock Factor 1 Alpha and Beta Isoforms

Heat shock causes proteins to denature or unfold which alters their function in the cell. Heat shock transcription factor 1 (HSF1) is responsible for the transcriptional response to protect cells from induced stress. Research has been conducted on different isoforms of the HSF1 protein, predominantly alpha and beta isoforms. Isoforms are versions of a protein that are similar, but not identical, and they may serve distinct functions. The goal of this research is to discover the subcellular localization pattern of the HSF1 alpha and beta isoforms as compared to large deletion mutants. The experimental approach involved growing NIH 3T3 cells on fibronectin coverslips. Separate dishes were transfected with expression plasmid DNA encoding the isoform (or deletion mutant). Coverslips were then incubated with a primary (anti-HA-tag) and fluorescent secondary antibody (either red or green), and viewed using fluorescent microscopy to visualize tagged cells. We have observed a different pattern of localization for the alpha and beta isoforms. Even in the absence of heat shock, HSF1 beta seems to be mostly localized in the nucleus, while HSF1 alpha is distributed in both the cytoplasm and the nucleus. Although we expected heat shock to potentially change the subcellular localization of HSF1 alpha, our preliminary observations suggest there is no striking redistribution of the HSF1 alpha after heat shock.

Students: Daniel Worden, Naraiman Malik, Trevor Rehm

Faculty Sponsor: Qun Wu (Economics, Finance & Accounting)

College Fund Portfolio Analysis

As a group, we have been working on an analysis of the 23 mutual funds that the College at Oneonta Foundation has in its portfolio holdings. We are using the Bloomberg terminals to investigate sector distribution, Sharpe ratio, scenario analysis, VaR, and the optimization.

Student: Annie Yoo

Faculty Sponsors: David Wong, Paul Lord (Biology)

Zebra Mussel (*Dreissena polymorpha*) Monitoring Using Navigation Buoys

Dreissena polymorpha (zebra mussels) is an aquatic invasive species in Otsego Lake, New York. Navigational buoys were used to monitor growth, settlement, and density of mussels colonized on the north and south sites of Otsego Lake. Colonized buoys on the north and south sites were taken out of the water on December 29 and December 31, 2012, respectively, after being in the water since April 14, 2012. Colonization occurred most on the light-shielded bottom sides of the buoy whereas the shallowest submersed side had the least amount of mussels. Mussels from the south site had significantly larger shell lengths than those from the north site. The metal anchor-chain ring at the deepest end of the buoy had the largest mussels while no difference was found among the rest. Specific substrate types and amount of available nutrition in the habitat are possible factors that contribute to colonization of zebra mussels. Additional research is recommended by comparing buoy designs to determine if buoys without light shielded bottoms will be less colonized.

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