Thursday December 03
5-7:30 pm
Riverview Ballroom
University Center
Fall Gala
December 3, 2015
Riverview Ballroom, University Center
5-7:30 p.m.

The Fall Gala is an annual showcase event to celebrate the research, scholarly and creative activities of University of Wisconsin-River Falls undergraduates. Campus URSCA from all areas of study is represented through undergraduate posters, short films, art exhibits, PowerPoints, and interactive displays in a content-rich event, with over 200 student participants. We hope you enjoy this opportunity to learn more about the hands-on research activities that are taking place every day on our campus. A special thanks to the Office of Alumni Relations for their contribution to the evening’s refreshments. The Fall Gala is sponsored by the UWRF student group Society for Undergraduate Research, Scholarly and Creative Activities (SURSCA) and the URSCA Office.

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College of Agriculture, Food and Environmental Sciences

Acre-Kendall, Landon

Investigating Potential Trout Refugia in the Kinnickinnic Watershed: An Initial Survey of Water Quality in Kelly Creek (Poster)

Research Collaborator(s): Shane Farnell
Faculty Mentor(s): Dr. Jill Coleman-Wasik, Plant and Earth Science

The Kinnickinnic River in western Wisconsin is classified as a Class 1 Trout Stream because it is important habitat for self-sustaining populations of brown (S. trutta) and native brook trout (S. fontinalis). Recent modeling efforts to determine the impact of climate change on the distribution of fish in Wisconsin predict significant to total loss of brook trout within the state under moderate to severe climate warming scenarios (Lyons et al., 2010). Small, spring-fed tributaries such as Kelly Creek may serve as refugia within the Kinnickinnic River watershed for trout populations under pressure from a warming climate.

A monitoring program was developed to characterize temperature and water quality trends within Kelly Creek. Continuously logging temperature monitors were deployed in early March at the springhead of Kelly Creek and at two sites downstream. In addition, dissolved oxygen, pH, conductivity, and flow measurements and samples for nutrients and suspended solids were collected at these sites as well as a fourth site located on a small intermittent stream above its confluence with the flow from the spring. Temperatures at and below the spring site remained at a nearly constant cool temperature (10-14° C), but experienced pulses of warming as a result of storm inputs and overland runoff. Ammonia levels were generally very low at all sites. Nitrate levels ranged from 2 to 3 parts per million at the spring site, but were elevated (as high as 7 ppm) in the intermittent stream suggesting either a source of nitrate to the system or different sources of groundwater feeding the spring and the stream. Discharge at Kelly Creek averages about 1.3 cfs, but was measured at 4 cubic feet per second during a large storm event. Consequently total suspended solids, which are generally very low, increased substantially during snowmelt and storm events. The early data from this project provide us with an early snapshot of the water quality and temperature dynamics present in small, spring fed streams like Kelly Creek and their potential to serve as refugia for trout under a changing climate.

Adkins, Shannon

**Behavioral Analysis on the Effect of Lavender Essential Oil on Stressed Equine and the Investigation of its Potential Impure Qualities** (Prezi presentation)

Faculty Mentor(s): Dr. Danielle Smarsh, Animal and Food Science

As public knowledge and demand of alternative, natural, holistic, and complementary medicine increases, broad questions are coming to light regarding the effectiveness and efficacy of these treatments. Most essential oil companies claim to have the purest oils; however, there are not standards in place in the US to determine what is pure and what is not. One type of complementary medicine is essential oils for aromatherapy. The goal of this research was assess the potential anti-anxiety properties of Lavender Essential Oil by conducting a basic chemical analysis and assess the potential anti-anxiety properties of Lavender Essential Oil with equine via behavioral analysis, heart rate, and salivary cortisol. The basic chemical analysis using gas chromatography was conducted on Lavendul augstifolia from two U.S. Companies. Results are being compared to the International Standards Organization, ISO-3515. In addition to the analysis, behavior and cortisol levels of eighteen horses is being assessed to determine the anti-anxiety effects of Lavender Oil on stressed equine. Six yearlings were placed in a novel barn and video recorded to conduct a behavioral analysis. This was done as a switch back study. The six yearlings were in the stall for an hour at a time for a total of two hours. The treatment was Lavender oil diffused in an ultrasonic diffuser just outside the stall running for the duration of the hour. A second switch back study was conducted with 18 geldings were observed for a behavioral analysis, heart rate was monitored, and cortisol levels were taken via saliva while a stressor was applied. The saliva swabs were attached to snaffle bits and headstalls were on for five minutes each time. Cortisol samples are still being collected at this time. It is expected that lavender will reduce the stress of the equines based off of behavioral analysis, heart rate, and cortisol levels.

Ahlers, Logan

**Soil and Environmental Implications of Land Rolling Corn** (Poster)

Faculty Mentor(s): Dr. Holly Dolliver, Plant and Earth Science

This goal of this study was to determine if there is a yield benefit to land rolling ground planted to corn.

Alves Chaves, Joicy

**Ploidy Characterization of Elderberry (Sambucus canadensis L.) Seedlings Treated with Trifluralin** (Poster)

Research Collaborator(s): Lucas Emidio da Silva

Faculty Mentor(s): Dr. David Zlesak, Plant and Earth Science
Elderberries (*Sambucus canadensis*) are a native plant grown commercially for their ornamental characters as well as their fruit high in antioxidants. The ploidy, or number of sets of chromosomes, can vary among members of a plant species. Polyploidy can impact: heterosis, plant fertility, and tissue sizes. Polyploidy can occur in multiple ways such as using spindle fiber inhibitors during mitosis. Those inhibitors will not allow the plant cell to divide into two daughter cells, resulting in one cell with double the sets of chromosomes. Later through mitosis, this doubled cell will undergo replication and result in daughter cells perpetuating the elevated chromosome number. In order to characterize ploidy conversion of a plant all three layers of dividing cells in the growing point must ultimately be characterized with different techniques for each layer. Seeds of a hardy population of elderberries with unique bipinnately compound leaves were collected in Minnesota. For this study we characterized layer I of these seedlings treated with trifluralin (0.086%) as well as untreated seedlings, which served as our controls. We identified an increase in guard cell length of doubled elderberry seedlings as well as less branching and darker foliage. Control seedlings (n=24) had guard cell length ranges from 15.7-20.7µM. The treated seedlings (n=72) range was 16.6-32.8µM. We propose that treated seedlings with guard cell lengths >22.3µM (44.4%) are suspected polyploids. This study was successful in characterizing layer I of trifluralin treated elderberry seedlings and sets the stage for further characterization of layers II and III of seedlings that are polyploid in layer I.

**Baier, Faith**

*Development of Acclimation to Reduce Flooring Novelty in Nursery Pigs* (Poster)

Research Collaborator(s): Andrew Keller, Amanda Munger
Faculty Mentor(s): Dr. Kurt Vogel, Animal and Food Science

The difficulty of moving pigs from nursery to finishing facilities may increase the possibility of unnecessary stress and inefficient moving time. There were two objectives in this study, the first objective was to determine the relationship of flooring surface and the latency of occupation upon first exposure (TRIAL 1). The second objective was to determine if acclimation to new flooring surfaces would improve the loading time as pigs were moved from nursery to finishing facilities (TRIAL 2). Both trials contained three replicates. TRIAL 1 included 6 pens of 6 pigs that were exposed to either a section of diamond plate aluminum (A) or a section of smooth concrete (C). Both flooring surfaces measured 0.61 m x 0.61 m. Two pens (A, C) were included in each replicate of TRIAL 1 and four pens were included in each replicate for TRIAL 2. TRIAL 2 included a total of 12 pens consisting of 6 pigs each that were exposed to both flooring surfaces described in TRIAL 1 for approximately four weeks (FLR) or no flooring surface (CTL). For TRIAL 1, behavior was assessed using focal sampling for the 24 hours after each flooring surface was placed in the treatment pens. The amount of time between the introduction of the flooring surface and the placement of 2 feet on the
flooring surface was recorded for each individual pig. For TRIAL 2, trailer loading was recorded for each pen during the transition from nursery to finishing facilities. The video was analyzed to quantify the time that elapsed between loading the first pig and the last pig within each pen. All data were expressed as pen means because the experimental unit was pen. For each trial, differences between treatment means were tested with Tukey’s tests in SAS 9.4. For TRIAL 1, no difference (P = 0.3183) was observed in the mean amount of time for pigs to place two feet on C (213 ± 1561 s) compared to A (2727 ± 1561 s). For TRIAL 2, no difference (P = 0.2293) was observed in the mean loading time for FLR (121 ± 25 s) and CTL (75 ± 25 s) pens. The results of this pilot study suggest that additional research is necessary to understand the relationship of flooring surfaces and the latency of occupation upon first exposure along with the impact of exposure to novel flooring surfaces on the loading time of nursery pigs.

Batista Paim, Marina

*Shelf Life Study of Processed Cheese* (PowerPoint and display)
Research Collaborator(s): Spencer Bemis, Nathalia Pereira Silva, Leah Granlund, Geoffrey Snyder
Faculty Mentor(s): Michelle Farner, Animal and Food Science

The group will be making a processed cheese block using aged cheese without the use of a preservative in order to study its shelf life.

Beisner, Megan

*Greenhouse Rain Garden* (Poster)
Research Collaborator(s): Jenna Schauer
Faculty Mentor(s): Dr. Joel Peterson, Agricultural Engineering Technology

The Greenhouse Rain Garden Project is focused on creating a rain garden that will be located to the south of the campus greenhouse. The main issue with the area behind the greenhouse is that the soil is eroding from the immense amount of water coming from the pipes off of the greenhouse. Our task is to design and implement a rain garden where the rock bed currently resides. The construction of a rain garden will prevent further erosion and also beautify the campus.

Bemis, Spencer

*Shelf Life Study of Processed Cheese* (Poster and display)
Research Collaborator(s): Nathalia Pereira Silva, Marina Batista Paim, Geoffrey Snyder, Leah Granlund
Faculty Mentor(s): Michelle Farner, Animal and Food Science

We will be making a process cheese spread using aged cheese, to be identified. The recipe will be the same for both groups presenting their spreads, except a
preservative will be added to one of the groups spread. Analytical and microbiological tests will be performed on both cheese spreads to determine time degradation of the product.

**Boles, Lee**

*In-furrow Experimental Insecticide to Control Corn Rootworm*  
*(PowerPoint)*

Faculty Mentor(s): Dr. Veronica Justen, Plant and Earth Science

Western corn root worm, *Diabrotica virgifera virgifera*, and northern corn rootworm, *Diabrotica barberi*, are important pests for field corn, *Zea mays* L. Corn rootworms are difficult to control because of their life cycle. Most growers control corn rootworm by using corn varieties that contain genetically modified traits, such as Cry35Ab1, Cry34Ab1, Cry3A, and Cry3Bb1. Corn rootworms have adapted and acquired resistance to some of the traits.

Two trials were conducted, one in Wisconsin, one in Minnesota to evaluate the influence of experimental in-furrow insecticides on the control of corn rootworms. The Minnesota field was inoculated with western corn rootworm eggs using an in-furrow system. Each trial was a randomized complete block design with eight treatments. The experimental insecticides were compared to Capture LFR, bifenthrin, and an untreated check for yield and damage. Damage was assessed by observing the percentage of plants lodged and root chewing. Root chewing was assessed on eight plants collected from the center rows of each treatment. The roots were washed and rated using the Iowa State Interactive Node-Injury scale.

**Breuer, Mitch**

*Small Grains Winnower* (Poster and display)

Research Collaborator(s): Siri Doyle  
Faculty Mentor(s): Dr. Joel Peterson, Agricultural Engineering Technology and Dr. Joe Shakal, Agricultural Engineering Technology

This project includes two different grain winnowers that can be used in the process of separating the seeds and chaff of dried up plants. One of the winnowers were constructed last semester (Spring 2015), while the other was constructed this semester (Fall 2015). The mechanisms are approximately 1.5' wide by 2.0' height by 0.5' thick. The plant matter is broken apart into small pieces and placed in the top of the winnower. A fan or vacuum is then turned on and the plant matter is dropped through the winnower. The suction power of the fan/vacuum then separates the seed from the chaff and the seeds fall through the winnower while the chaff is pulled into the vacuum.

Both winnowers will be on display along with a poster created by the group showing the design process and construction process.
D'Huyvetter, Nickolas

**Shelf Life Study of Processed Cheese: Sorbic Acid** (PowerPoint and display)
Research Collaborator(s): Allison Nohre, Sierra Solum, Manoella Moura
Faculty Mentor(s): Michelle Farner, Animal and Food Science

The purpose of this study was to determine the shelf stability of processed cheese. An aged cheddar was utilized for this study, with the addition of water, butter, salt, nonfat dry milk, emulsifying salts, and sorbic acid for stability. Through analytical and microbial testing the goal was to see the time degradation of the cheese product, and determine whether or not the sorbic acid made an impact on increasing the shelf life.

Doyle, Siri

**Small Grains Winnower** (Poster and display)
Research Collaborator(s): Mitch Breuer
Faculty Mentor(s): Dr. Joel Peterson, Agricultural Engineering Technology and Dr. Joe Shakal, Agricultural Engineering Technology

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Emidio da Silva, Lucas

**Ploidy Characterization of Elderberry (Sambucus canadensis L.) Seedlings Treated with Trifluralin** (Poster)
Research Collaborator(s): Joicy Alves Chaves
Faculty Mentor(s): Dr. David Zlesak, Plant and Earth Science

Elderberries (*Sambucus canadensis*) are a native plant grown commercially for their ornamental characters as well as their fruit high in antioxidants. The ploidy, or number of sets of chromosomes, can vary among members of a plant species. Polyploidy can impact: heterosis, plant fertility, and tissue sizes. Polyploidy can occur in multiple ways such as using spindle fiber inhibitors during mitosis. Those inhibitors will not allow the plant cell to divide into two daughter cells, resulting in one cell with double the sets of chromosomes. Later through
mitosis, this doubled cell will undergo replication and result in daughter cells perpetuating the elevated chromosome number. In order to characterize ploidy conversion of a plant all three layers of dividing cells in the growing point must ultimately be characterized with different techniques for each layer. Seeds of a hardy population of elderberries with unique bipinnately compound leaves were collected in Minnesota. For this study we characterized layer I of these seedlings treated with trifluralin (0.086%) as well as untreated seedlings, which served as our controls. We identified an increase in guard cell length of doubled elderberry seedlings as well as less branching and darker foliage. Control seedlings (n=24) had guard cell length ranges from 15.7-20.7µM. The treated seedlings (n=72) range was 16.6-32.8µM. We propose that treated seedlings with guard cell lengths >22.3µM (44.4%) are suspected polyploids. This study was successful in characterizing layer I of trifluralin treated elderberry seedlings and sets the stage for further characterization of layers II and III of seedlings that are polyploid in layer I.

Farnell, Shane

*Investigating Potential Trout Refugia in the Kinnickinnic Watershed: An Initial Survey of Water Quality in Kelly Creek* (Poster)

Research Collaborator(s): Landon Acre-Kendall
Faculty Mentor(s): Dr. Jill Coleman-Wasik, Plant and Earth Science

The Kinnickinnic River in western Wisconsin is classified as a Class 1 Trout Stream because it is important habitat for self-sustaining populations of brown (S. trutta) and native brook trout (S. fontinalis). Recent modeling efforts to determine the impact of climate change on the distribution of fish in Wisconsin predict significant to total loss of brook trout within the state under moderate to severe climate warming scenarios (Lyons et al., 2010). Small, spring-fed tributaries such as Kelly Creek may serve as refugia within the Kinnickinnic River watershed for trout populations under pressure from a warming climate.

A monitoring program was developed to characterize temperature and water quality trends within Kelly Creek. Continuously logging temperature monitors were deployed in early March at the springhead of Kelly Creek and at two sites downstream. In addition, dissolved oxygen, pH, conductivity, and flow measurements and samples for nutrients and suspended solids were collected at these sites as well as a fourth site located on a small intermittent stream above its confluence with the flow from the spring. Temperatures at and below the spring site remained at a nearly constant cool temperature (10-14° C), but experienced pulses of warming as a result of storm inputs and overland runoff. Ammonia levels were generally very low at all sites. Nitrate levels ranged from 2 to 3 parts per million at the spring site, but were elevated (as high as 7 ppm) in the intermittent stream suggesting either a source of nitrate to the system or different sources of groundwater feeding the spring and the stream. Discharge at Kelly Creek averages about 1.3 cfs, but was measured at 4 cubic feet per
second during a large storm event. Consequently total suspended solids, which are generally very low, increased substantially during snowmelt and storm events. The early data from this project provide us with an early snapshot of the water quality and temperature dynamics present in small, spring fed streams like Kelly Creek and their potential to serve as refugia for trout under a changing climate.


**French, Amanda**

*The Effects of Mining and Land Reclamation on Soil Carbon Storage and Flux* (PowerPoint)

Faculty Mentor(s): Dr. Holly Dolliver, Plant and Earth Science

The demand for oil is growing worldwide. Conventional oil deposits have already been extracted and our future oil supply is of great concern. New technology is allowing us to extract unconventional oil, also called shale oil using hydraulic fracturing. Hydraulic fracturing uses high purity silica sand as a proppant. Wisconsin’s bedrock sand is one of the best sources of frac sand in the world. Silica sand mining has rapidly expanded in Wisconsin. A long-term field study is being conducted in Chippewa County, Wisconsin to evaluate the impact of this mining on soil physical, hydrological and biological characteristics and how best to reclaim the land after mining. Specifically this project evaluated soil carbon dynamics in pre and post mined (reclaimed) areas. During Summer 2015, a single soil was quantified across three stages of mining operations: 1.) native soil (pre-mining), 2.) stripped/stockpiled soil, and 3.) reclaimed soil. A total of ten sampling points were randomly chosen at each stage. Surface soil samples were collected and total soil carbon measured using an Elementar CNS analyzer. Carbon flux was also measured at each site using a Li-Cor 8100A automated gas flux system. The results from our analysis will be summarized.

**Granlund, Leah**

*Shelf Life Study of Processed Cheese* (Poster and display)

Research Collaborator(s): Spencer Bemis, Nathalia Pereira Silva, Marina Batista Paim, Geoffrey Snyder

Faculty Mentor(s): Michelle Farner, Animal and Food Science

A processed cheese spread will be made from an aged cheese block. Tests will be done to determine the affects of aging on the processed cheese spread.

**Grzybowski, Samantha**

*Initial Assessment of Amphibian Use of Seasonal Pool Habitats in the Kinnickinnic Watershed* (Poster)
Faculty Mentor(s): Dr. Jill Coleman-Wasik, Plant and Earth Science

Wetlands are a very key part to our ecosystem. One type of wetland is an ephemeral pool. Unfortunately there are not many in our region, which makes the ones we do have even more important. There has not been any research on amphibians in the Kinnickinnic watershed, so for my research I conducted an initial assessment of amphibians that utilize ephemeral pools for breeding. For this research I deployed pit fall traps, PVC pipe refugia, and recording devices at three sites. I also conducted road surveys that covered the upper, middle, and lower portions of the watershed. Pit fall traps and the PVC pipe refugia were not a viable means for sampling. The recordings and road surveys produced a robust set of data. Unfortunately, some data loss was experienced. Currently with the accessible data, it has been determined there are populations of wood frogs, spring peepers, and western chorus frogs in the Kinnickinnic watershed that utilize ephemeral pools.

Hite, Rebekah

**Characterization of Endophytic Contamination of Main Culture Lines in the Plant Tissue Growth Room at UW-River Falls** (Poster)

Faculty Mentor(s): Dr. David Zlesak, Plant and Earth Science

Endophytic bacteria are common occurrence in many types of plants in nature, living inside a tissue of the plant without causing a disease. However, in Plant Tissue Culture (PTC), the endophytic bacteria can present a problem and overwhelm its host plant due to the excess nutrient availability. At UWRF, several of our main line plant cultures have trouble thriving in PTC in spite of common measures such as baterialstatic additives like Plant Protective Media. We characterized six individual bacterium from five separate primary culture lines in the PTC lab: Ageratum #34, Ageratum ‘John Eustice’, Magnolia RISL #4, Little Blue Stem Grass ‘Blue Heaven’, and Heliopsis VRPB. We established components of their phenotypic and metabolic profiles along with their antibiotic susceptibilities in order to find a route of treatment for the establishment of clean cultures. An individual recommendation of course of antibiotic additions to growth media as a treatment for each individual bacterium will be presented. In addition, this poster will showcase ongoing research and development of these methods as an inter-departmental research project between Plant and Earth Science and Biology.

Johnsen, Natalie

**A Cost and Comparison Performance of a Net-Zero Eco Village with Conventional Construction Practices** (Poster)

Faculty Mentor(s): Dr. Jarod Blades, Plant and Earth Science and Mike Noreen, River Falls Municipal Utility
This Project will compare the cost and energy performance of the River Falls, Wisconsin Eco Village with conventionally constructed homes that have a similar footprint. We would also like to compare a sustainably-constructed LEED dormitory at UW-River Falls with a standard dormitory. This project is collaboration with the River Falls Municipal Utility, University of Wisconsin-River Falls and St. Croix Valley Habitat for Humanity. This Project aims to show anyone can own a net zero home and to present results of the cost and energy consumption by showing that affordability and efficiency can come to a comfortable cost and home.

Keller, Andrew

*Development of Acclimation to Reduce Flooring Novelty in Nursery Pigs* (Poster)

Research Collaborator(s): Faith Baier, Amanda Munger

Faculty Mentor(s): Dr. Kurt Vogel, Animal and Food Science

The difficulty of moving pigs from nursery to finishing facilities may increase the possibility of unnecessary stress and inefficient moving time. There were two objectives in this study; the first objective was to determine the relationship of flooring surface and the latency of occupation upon first exposure (TRIAL 1). The second objective was to determine if acclimation to new flooring surfaces would improve the loading time as pigs were moved from nursery to finishing facilities (TRIAL 2). Both trials contained three replicates. TRIAL 1 included 6 pens of 6 pigs that were exposed to either a section of diamond plate aluminum (A) or a section of smooth concrete (C). Both flooring surfaces measured 0.61 m x 0.61 m. Two pens (A, C) were included in each replicate of TRIAL 1 and four pens were included in each replicate for TRIAL 2. TRIAL 2 included a total of 12 pens consisting of 6 pigs each that were exposed to both flooring surfaces described in TRIAL 1 for approximately four weeks (FLR) or no flooring surface (CTL). For TRIAL 1, behavior was assessed using focal sampling for the 24 hours after each flooring surface was placed in the treatment pens. The amount of time between the introduction of the flooring surface and the placement of 2 feet on the flooring surface was recorded for each individual pig. For TRIAL 2, trailer loading was recorded for each pen during the transition from nursery to finishing facilities. The video was analyzed to quantify the time that elapsed between loading the first pig and the last pig within each pen. All data were expressed as pen means because the experimental unit was pen. For each trial, differences between treatment means were tested with Tukey’s tests in SAS 9.4. For TRIAL 1, no difference (P = 0.3183) was observed in the mean amount of time for pigs to place two feet on C (213 ± 1561 s) compared to A (2727 ± 1561 s). For TRIAL 2, no difference (P = 0.2293) was observed in the mean loading time for FLR (121 ± 25 s) and CTL (75 ± 25 s) pens. The results of this pilot study suggest that additional research is necessary to understand the relationship of flooring surfaces and the latency of occupation upon first exposure along with the
impact of exposure to novel flooring surfaces on the loading time of nursery pigs.

Klapoetke, Alexandra

Agricultural Education Demand in Wisconsin from 2010-2014 (Poster)
Faculty Mentor(s): Dr. Tim Buttles, Agricultural Education

A shortage of agricultural education teachers for middle and high school programs has been identified at the national level (Foster, Lawver, & Smith, 2015; National Association of Agricultural Educators, 2013). This mirrors a teacher shortage across all content areas in the United States (Ingesoll, 2001) and internationally (Lindqvist, Nordänger, & Carlsson, 2014).

Teacher turnover has been linked to a decrease in student academic performance (Ronfeldt, Loeb, & Wyckoff, 2013) and is tied to National Research Agenda Priority 5: Efficient and Effective Agricultural Education Programs (Doerfert, 2011).

The conceptual framework for this study revolves around the assertion of Ingersoll (2011) that studying teacher retention is a critical element of addressing a teacher shortage. The importance of attrition has also been confirmed in secondary agricultural education (Boone & Boone, 2009; Clark, Kelsey, & Brown, 2014). The purpose of this study was to determine the cause of teacher openings in one state over a four year period to better understand the demand side of the teacher shortage.

Lafer, Landon

Vertical Hydroponic Tower Garden (Poster)
Research Collaborator(s): Aaron Timm, Mellisa Nelson
Faculty Mentor(s): Dr. Joel Peterson, Agricultural Engineering Technology and Dr. Joe Shakal, Agricultural Engineering Technology

Our project is, as the title would suggest, a hydroponic garden system that is built in the vertical direction. Our project was to design and develop a vertical hydroponic system that could be purchased by home owners and could be placed in any room within someone's house.

Miotke, Alison

The Impact of a Living Greenwall on Student Attitudes, Moods, and Academic Performance (Poster)
Faculty Mentor(s): Dr. Travis Tubre, Psychology; Dr. Terry Ferriss, Plant and Earth Science; Dr. David Trechter, Agricultural Economics

Research from multiple disciplines suggests that the physical environment in which an individual lives and works can impact their lifestyle, health, well-being, and productivity. Studies conducted in office and academic settings in such
diverse locations as Japan (Shibata & Suzuki, 2004), the UK (Knight & Haslam, 2010), and the Netherlands (Nieuwenhuis et. al., 2014) have consistently demonstrated that indoor plants positively impact student and worker moods, attitudes, and productivity. The goal of our research was to extend on this previous research by studying whether these same benefits would be seen for a Greenwall (i.e., a vertically arranged, living wall of plants) that is built into the physical environment of a classroom. To confirm the initial equivalence of the room targeted for the Greenwall installation and the control classroom, we ran a series of experimental sessions, where student participants completed survey measures on mood, attitudes and performance after being randomly assigned to either the target room for the Greenwall or the control classroom. All pre-existing differences were either non-significant or favored the control room. Following the installation of the Greenwall, we repeated the process, examining differences between the Greenwall-enhanced room and the control room. Overall, we found that both general and performance-related environmental perceptions were significantly higher in the Greenwall-enhanced classroom. Our results could be beneficial to academic and professional organizations looking for evidence-based environmental designs that optimize student and worker well-being.

**Moura, Manoella**

*Shelf Life Study of Processed Cheese: Sorbic Acid* (PowerPoint and display)
Research Collaborator(s): Allison Nohre, Sierra Solum, Nickolas D'Huyvetter
Faculty Mentor(s): Michelle Farner, Animal and Food Science

The purpose of this study was to determine the shelf stability of processed cheese. An aged cheddar was utilized for this study, with the addition of water, butter, salt, nonfat dry milk, emulsifying salts, and sorbic acid for stability. Through analytical and microbial testing the goal was to see the time degradation of the cheese product, and determine whether or not the sorbic acid made an impact on increasing the shelf life.

**Munger, Amanda**

*Development of Acclimatization to Reduce Flooring Novelty in Nursery Pigs* (Poster)
Research Collaborator(s): Faith Baier, Andrew Keller
Faculty Mentor(s): Dr. Kurt Vogel, Animal and Food Science

The difficulty of moving pigs from nursery to finishing facilities may increase the possibility of unnecessary stress and inefficient moving time. There were two objectives in this study, the first objective was to determine the relationship of flooring surface and the latency of occupation upon first exposure (TRIAL 1). The
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Nelson, Mellisa

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Research Collaborator(s): Aaron Timm, Landon Laher
Faculty Mentor(s): Dr. Joel Peterson, Agricultural Engineering Technology and Dr. Joe Shakal, Agricultural Engineering Technology

Our project is, as the title would suggest, a hydroponic garden system that is built in the vertical direction. Our project was to design and develop and vertical hydroponic system that could be purchased by home owners and could be placed in any room within someone’s house.

Nohre, Allison

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Nohre, Allison

*The Effects of Emulsifying Salts on Smoked Gouda Processed Cheese* (Poster)

Research Collaborator(s): Molly Patterson
Faculty Mentor(s): Michelle Farner, Animal and Food Science

According to the USDA, per capita cheese consumption in the US has increased over the last 25 years. More specifically, Gouda volume sales in grocery stores have increased by double digits in 2011-2012. By re-purposing edible waste from current gouda production to develop a new marketable product, a new processed cheese was able to be created. The processed cheese was made using varying combinations of emulsifying salts. Several characteristics were observed such as: pH, meltability, sliceability, and moisture content of three separate trials. In addition, a sensory evaluation was conducted with the participation of unbiased individuals. In the production of processed cheese, emulsifying salts are responsible for physiochemical variations within the product. This development could be the gateway to a new line of processed cheese which would fulfill the demand in the marketplace and reduce edible waste products in the cheese industry.

Patterson, Molly

*The Effects of Emulsifying Salts on Smoked Gouda Processed Cheese* (Poster)

Research Collaborator(s): Allison Nohre
Faculty Mentor(s): Michelle Farner, Animal and Food Science

According to the USDA, per capita cheese consumption in the US has increased over the last 25 years. More specifically, Gouda volume sales in grocery stores have increased by double digits in 2011-2012. By re-purposing edible waste from current gouda production to develop a new marketable product, a new processed cheese was able to be created. The processed cheese was made using varying combinations of emulsifying salts. Several characteristics were observed such as: pH, meltability, sliceability, and moisture content of three separate trials. In addition, a sensory evaluation was conducted with the participation of unbiased individuals. In the production of processed cheese, emulsifying salts are responsible for physiochemical variations within the product. This development could be the gateway to a new line of processed cheese which
would fulfill the demand in the marketplace and reduce edible waste products in the cheese industry.

**Pereira Silva, Nathalia**

*Shelf Life Study of Processed Cheese* (PowerPoint and display)
Research Collaborator(s): Spencer Bemis, Leah Granlund, Marina Batista Paim, Geoffrey Snyder
Faculty Mentor(s): Michelle Farner, Animal and Food Science

A processed cheese will be made using an aged cheese. Analytical and microbiological tests will be performed on the cheese to determine time degradation of cheese product.

**Schauer, Jenna**

*Greenhouse Rain Garden* (Poster)
Research Collaborator(s): Megan Beisner
Faculty Mentor(s): Dr. Joel Peterson, Agricultural Engineering Technology

The Greenhouse Rain Garden Project is focused on creating a rain garden that will be located to the south of the campus greenhouse. The main issue with the area behind the greenhouse is that the soil is eroding from the immense amount of water coming from the pipes off of the greenhouse. Our task is to design and implement a rain garden where the rock bed currently resides. The construction of a rain garden will prevent further erosion and also beautify the campus.

**Shaw, Andrew**

*The Influence of Population Density on Seed Yield in the Production of Grain Amaranth* (Poster)
Faculty Mentor(s): Dr. Veronica Justen, Plant and Earth Science

A continuation of the 2014-2015 project assessing vegetative characteristics of a wide variety of Amaranth accessions. The 4 most successful accessions of the 2014-2015 project were planted in 12 sq. ft. plots at two differing population densities to evaluate yield potential for field production of amaranth.

**Snyder, Geoffrey**

*Shelf Life Study of Processed Cheese* (Poster and display)
Research Collaborator(s): Spencer Bemis, Nathalia Pereira Silva, Marina Batista Paim, Leah Granlund
Faculty Mentor(s): Michelle Farner, Animal and Food Science

Our group will be making a processed cheese spread using aged cheese. Analytical and microbiological tests will be performed on the cheese to determine time degradation of the product.
Solum, Sierra

**Shelf Life Study of Processed Cheese: Sorbic Acid** (PowerPoint and display)
Research Collaborator(s): Allison Nohre, Nickolas D’Huyvetter, Manoella Moura
Faculty Mentor(s): Michelle Farner, Animal and Food Science

The purpose of this study was to determine the shelf stability of processed cheese. An aged cheddar was utilized for this study, with the addition of water, butter, salt, nonfat dry milk, emulsifying salts, and sorbic acid for stability. Through analytical and microbial testing the goal was to see the time degradation of the cheese product, and determine whether or not the sorbic acid made an impact on increasing the shelf life.

Sorenson, Emily

**Quantifying the Effects of Frac Sand Waste Fines on Subsurface Water Quality** (Poster)
Faculty Mentor(s): Dr. Holly Dolliver, Plant and Earth Science

Silica sand mining for frac sand production has increased substantially in the United States over the last five years. Since only a certain size range of sand is desirable for fracking operations, the processing of sand generates large volumes of waste material, which consists mostly of silt and clay. 'Waste fines' are typically incorporated with overburden and used to fill in the mined area during reclamation. A long-term field study is being conducted in Chippewa County, Wisconsin to evaluate the effects of using waste fines as a soil amendment during reclamation. While the waste fines have the ability to improve moisture retention and soil physical properties, they are known to contain heavy metals and nutrients that could pose environmental concerns. For this particular study, subsurface water quality was monitored using suction cup lysimeters. Leachate samples were collected bimonthly during the growing season and analyzed for heavy metals using ICP-MS. The results from our first field season will be presented.

Stephenson, Emma

**Effect of low fat or high fat dry distiller’s grains supplementation on forage intake and digestibility in beef heifers** (Poster)
Faculty Mentor(s): Dr. Amy Radunz, Animal and Food Science

This project evaluated the effects that two types of Dried Distiller's Grains (DDG) supplement, the high fat variety and low fat variety, had on total tract digestibility and forage intake in 30 Angus, Hereford, and Angus cross yearling beef heifers. Their daily feed intake was measured using the Calan Gate System to determine dry matter intake for each individual heifer. Feed and fecal
samples were collected about four weeks into the project which were sent to the lab for total nutrient analysis to determine total tract digestibility.

**Stewart, Zach**

*Prairie Monitoring* (Poster)

Faculty Mentor(s): Dr. Jarod Blades, Plant and Earth Science

Beginning of a long term monitoring on Foster Cemetery Prairie and Alexander Prairie.

**Timm, Aaron**

*Vertical Hydroponic Tower Garden* (Poster)

Research Collaborator(s): Landon Laher, Mellisa Nelson

Faculty Mentor(s): Dr. Joel Peterson, Agricultural Engineering Technology and Dr. Joe Shakal, Agricultural Engineering Technology

Our project is, as the title would suggest, a hydroponic garden system that is built in the vertical direction. Our project was to design and develop a vertical hydroponic system that could be purchased by home owners and could be placed in any room within someone's house.
College of Arts and Sciences

Al-Humayani, Farris

2015 WSGC State and Midwest Regionals Collegiate Rocket Competition (Poster)
Research Collaborator(s): Jose Bermeo, Justin Diercks, August Fritze, Robert Dietrich
Faculty Mentor(s): Dr. Glenn Spiczak, Physics

Last Spring, Team Falcon 1 made its fifth annual appearance at the Wisconsin Space Grant Consortium Collegiate Rocket Competition. After rigorous work being invested into the science behind rocketry, the team progressed to the Midwest Regionals competition! Observe a poster that expands on the basics behind the team's efforts in the 2015 competition along with photos, diagrams, and on-board footage of both launches.

Azasu, Samuel

How Long Will I Love You (Short Film)
Faculty Mentor(s): Erik Johnson, Stage and Screen Arts

The story is about a girl who is torn between her abusive boyfriend and her next door neighbor who admires her but is too shy to come forward.

Azasu, Samuel

The Gun (Short Film)
Faculty Mentor(s): Erik Johnson, Stage and Screen Arts

One guy's plan backfires. A film about gun violence!

Barton, Samuel

Local Collaboration Project on Nitrogen Fixing Bacterium Inoculums for Potential Use in Seed Treatment for Crops (Poster)
Research Collaborator(s): Rebekah Hite
Faculty Mentor(s): Dr. Fred Bonilla, Biology

Exterior nitrogen fixation is an integral part of the nutrients needed by crops to grow and produce a viable harvest. The use of inoculums to coat a seed in prior to planting allows farmers to plant the bacteria that fix nitrogen from the environment into a carbon bound form that the crop can then absorb and process. Planting the two in tandem potentially creates some amount of resistance in the crop to environmental fluctuations that are potentially damaging. Previous protocol established for testing B. japonicum effectiveness
needed modifications to be used in an industrial setting. Research was done to further validate the methods used with their modifications, and a novel route of using Real Time PCR to test for bacterium quantities on seeds was evaluated against a standard curve. Our research presents our current findings and showcases a collaborative effort between a local River Falls business and UWRF for the enhancement of crop health through potential natural methods.

Beck, Casey

Wheel Thrown Investigation (Artwork)
Faculty Mentor(s): Rhonda Willers, Art

I will be showing a few current pieces that show what I am currently working on and investigating on the wheel. This includes wheel thrown forms with different carving reduction techniques and glaze ideas.

Bergs, David

Hidden Trails along the Kinnickinnic (Poster)
Research Collaborator(s): Danilo Silva da Silva
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

There are several miles of trails along the Kinnickinnic River near Glen Park that are unmapped. Using a GPS and field observations, point and line data were collected for these well-hidden single-track trails. Using the GPS data we produced a map of current trails and an elevation profile of important routes.

Bermeo, Jose

2016 WSGC State and Midwest Regionals Collegiate Rocket Competition (Poster)
Research Collaborator(s): Farris Al-Humayani, Justin Diercks, August Fritze, Robert Dietrich
Faculty Mentor(s): Dr. Glenn Spiczak, Physics

Last Spring, Team Falcon 1 made its fifth annual appearance at the Wisconsin Space Grant Consortium Collegiate Rocket Competition. After rigorous work being invested into the science behind rocketry, the team progressed to the Midwest Regionals competition! Observe a poster that expands on the basics behind the team's efforts in the 2015 competition along with photos, diagrams, and on-board footage of both launches.

Blatz, Jason

The Balloon Project (Poster and balloon display)
Research Collaborator(s): Diego Valadares, Sammi Grzybowski
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

Aerial photography has been used in city planning, wildlife protection, and agricultural research, among others. This project focuses on developing techniques in order to obtain quality imagery using a digital camera and helium balloon. The images were taken at Hoffman Park in River Falls, Wisconsin, where we collected data on three separate occasions. Following data collection, the images were processed and used in a Geographic Information System (GIS) as reference material for mapping.

**Bloch, Danielle**

*Perceived Stress and Facebook Usage and Frequency* (Poster)
Research Collaborator(s): Kelly Vodra
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

This study attempts to collect information about how college students perceive stress and how their stress levels are affected by Facebook usage and social interaction. Stress levels will be measured by looking at common hassles experienced by college students during semesters. We will also look at the amount of social interaction activity.

**Boehmer, Danielle**

*Relationship status, relationship commitment, relationship satisfaction, and alcohol use among college students.* (Poster)
Research Collaborator(s): Erica Cimochowski
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

This study is designed to look at an individual's relationship factors and how they influence alcohol use. Relationship factors consist of relationship status, relationship commitment, and relationship satisfaction. Participants will be undergraduates from the University of Wisconsin-River Falls. Participants would have completed an online confidential survey using Qualtrics.

**Borba, Gabriel**

*The diet of Brook stickleback, Culae incontans (Pisces: Gasterosteidae) in a small freshwater ecosystem in River Falls, WI.* (Poster)
Faculty Mentor(s): Dr. John Wheeler, Biology

Aquatic invertebrate communities and fishes interact directly during predation and competition for shared food resources, and indirectly through cascading changes in aquatic ecosystems. Fish presence alters the composition and abundance of aquatic invertebrate communities present in the ecosystem. Species like the Brook stickleback (Culaea inconstans Kirtland), interact with macroinvertebrates by predating both their early instars and prey base. I
investigated the diet (prey) of Culaea inconstans in a freshwater ecosystem in the city of River Falls. Fish were caught during two sessions in minnow traps left overnight. All specimens were preserved in 70% ethanol. In the laboratory, I measured the total length and total weight of each individual. Then I measured the total length, total weight full, and total weight empty of their stomachs. All food items were identified with the aid of a stereomicroscope. To calculate the relative (percentage) importance of each food item I measured numerical abundance (%N), item volume (%V), and frequency of occurrence (%FO). Those parameters were added to the IRI (Index of Relative Importance) to determine the importance percentage of each food item. Data was analyzed with the Statistix 8 program. Brook sticklebacks feed almost exclusively on macroinvertebrates. The most abundant prey items were cladocerans, larval dipterans, and larval trichopterans (37.5%, 14.1%, and 24.2%, respectively). By volume, the most important taxa were larval dipterans, trichoptera, amphipods, and nematodes (27.9%, 20.2%, 21.7%, and 20.2%, respectively). The most frequent prey were cladocerans and larval dipterans (both 19%). Overall, the most important prey items (IRI) were cladocerans, larval dipterans, and larval trichopterans (29.4%, 28.1%, and 14.9%, respectively). When male sticklebacks were compared to females, total weight was significant (P= 0.0000), likely due to the presence of eggs. There was no difference in the diet of males compared to females.

Bruns, Elizabeth

*Self-Esteem Relates to College Students’ Self-Representation on Facebook* (Poster)

Research Collaborator(s): Emilee Sesing
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

With social media becoming an everyday activity for most, research in this domain is critical to understanding other people through this media. Our study examines the relationship between self-esteem and self-representation on Facebook among college students. We expect to see individuals with low self-esteem to have higher self-representation concerns than those with high self-esteem. In relation to gender, we expect that females will have higher concerns with self-representation on Facebook than males. We do not expect to see an interaction between self-esteem and gender. Participants were recruited from the Psychology Department of University of Wisconsin-River Falls and asked to complete an online survey regarding these variables.

Chieves, Dillon

*An Investigation of the Perceived Importance and Inclusion of Music Standards within Minnesota and Wisconsin Classrooms* (Poster)

Research Collaborator(s): Rebecca Huth, Ryan Nattrass, Richard Thomas
Faculty Mentor(s): Dr. Paul Budde, Music
The purpose (objective) of this study “is to gather information from current music educators in Minnesota and Wisconsin regarding their attitudes about and implementation of state and national music standards within their classrooms.”

Our research will be conducted via an online survey sent to approximately 5500 music educators in Wisconsin and Minnesota (roughly 2700 in Minnesota and 2800 in Wisconsin, per the estimates given by the Minnesota Music Educators Association and Wisconsin Music Educators Association). The survey will be distributed this school year, with a target of mid-January 2016.

With the information gathered from the survey, the goal of this project is to discover whether there a correlation between a music educator’s (a) gender, (b) age, (c) school setting (rural-urban-suburban), (d) classes taught (band-choir-orchestra-classroom music-other) (e) grade level taught (K-12), (f) teaching experience (years), or (g) highest degree earned regarding the value that s/he associates with the inclusion of specific music standards when constructing daily lesson plans, regarding his/her knowledge about State (Minnesota and Wisconsin) and National (1994 and 2014) music standards, and regarding his/her inclusion of specific music standards within daily lesson plans?

Christenson, Marie

Skin Cancer and Its Treatment (Poster)
Faculty Mentor(s): Dr. Betsy Gerbec, Biology

This project covers a brief introduction to what skin cancer is, the various types, and basic prevention of the disease. However, the main focus will be the treatment methods of skin cancer today.

Cimochowski, Erica

Relationship status, relationship commitment, relationship satisfaction, and alcohol use among college students. (Poster)
Research Collaborator(s): Danielle Boehmer
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

This study is designed to look at an individual’s relationship factors and how they influence alcohol use. Relationship factors consist of relationship status, relationship commitment, and relationship satisfaction. Participants will be undergraduates from the University of Wisconsin-River Falls. Participants would have completed an online confidential survey using Qualtrics.

Cole, Kris

Development of a new miniature bioreactor and system to generate artificial breast cancer tissues using MCF-7 and MCF10A cells. (Poster)
Faculty Mentor(s): Dr. Timothy Lyden, Biology
During the past decade, the UWRF Tissue and Cellular Innovation Center has been focused on the application of natural extra-cellular matrix materials as biomimetic scaffolds for small-scale 3D artificial tissue (AT) and artificial tumor tissue (ATT) modeling. These constructs represent much more physiologically relevant in-vitro models than most standard 2D cultures and are now the focus of a series of studies aimed at developing new models of cancer progression and metastasis. Of particular interest is the modeling of breast adenocarcinoma and monitoring/testing of the progression of these constructs into metastasis-related processes. Although we have been successful in generating ATT’s from several cell lines and primary patient tumors, our approach has always been limited by relatively non-standardized culture conditions. These conditions were consistent enough for basic construct characterization and general "proof-of-concept" validation but next-step direct experimentation has been limited by these culture conditions. In late 2013, we partnered with Microscopy Innovations, LLC to begin testing their mPrep capsules as miniature bioreactors in combination with our standard natural matrix/scaffold materials. In these studies, we are working to standardize culture conditions and develop a prototype reactor system approach to study MCF-7 breast adenocarcinoma cell-derived ATT’s and their progression toward metastasis. Early loading studies of mPrep capsules with MCF-7, MCF10A non-cancerous ductal cells as well as stromal fibroblast and pre-adipocyte (3T3-Swiss and L1) cell lines have generated substantial tumor and control constructs. Ongoing characterization studies are examining the relative population dimensions of cancer stem cells as well as EMT/MET markers and cell cycle status of both ATT cells and the abundant shed cells appearing in the flow-through effluent of the capsule chambers.

**Cota, Adry Cota**  
*Detroit Alive* (Artwork)  
Faculty Mentor(s): Brett Kallusky, Art

Detroit Alive is an exploration of Detroit Michigan threw photography. Detroit Alive is to better understand a city that has been utterly suffocated by politics and negative media. The research I pursued was to see what the city could offer for my self. the city has changed my life, and view of politics.

**Diercks, Justin**  
*2017 WSGC State and Midwest Regionals Collegiate Rocket Competition* (Poster)  
Research Collaborator(s): Farris Al-Humayani, Jose Bermeo, August Fritze, Robert Dietrich  
Faculty Mentor(s): Dr. Glenn Spiczak, Physics

Last Spring, Team Falcon 1 made its fifth annual appearance at the Wisconsin Space Grant Consortium Collegiate Rocket Competition. After rigorous work
being invested into the science behind rocketry, the team progressed to the Midwest Regionals competition! Observe a poster that expands on the basics behind the team's efforts in the 2015 competition along with photos, diagrams, and on-board footage of both launches.

**Dietrich, Robert**

*2019 WSGC State and Midwest Regionals Collegiate Rocket Competition (Poster)*

Research Collaborator(s): Farris Al-Humayani, Jose Bermeo, Justin Diercks, August Fritze

Faculty Mentor(s): Dr. Glenn Spiczak, Physics

Last Spring, Team Falcon 1 made its fifth annual appearance at the Wisconsin Space Grant Consortium Collegiate Rocket Competition. After rigorous work being invested into the science behind rocketry, the team progressed to the Midwest Regionals competition! Observe a poster that expands on the basics behind the team's efforts in the 2015 competition along with photos, diagrams, and on-board footage of both launches.

**Faulks, Michael**

*Mudita: A study of the effects of sympathetic joy on various aspects of individual well-being (PowerPoint)*

Faculty Mentor(s): Dr. Todd Wilkinson, Psychology

Mudita, or sympathetic joy, is the act of feeling happy for another individual’s happiness or success. This experimental study measured Mudita’s effects on various aspects of individual well-being in undergraduates. The results suggest Mudita practice has beneficial effects on certain predictors of individual well-being.

**Faulks, Michael**

*The effects of white noise on analytical reasoning in undergraduates (Poster)*

Faculty Mentor(s): Dr. Melanie Ayres, Psychology

Auditory white noise has been shown to have helpful effects on certain cognitive tasks in specific populations; the rationale for these effects is that white noise mediates attentional-ability due to the masking of potentially distracting background noise. Analytical reasoning is a type of executive function that involves complex cognitive processing. This study builds upon existing research by assessing performance a type of cognitive task that has never been paired with a white noise experimental condition.
Fitzenberger, Jared

Testing Whether Nucleus Honeybee Colonies Enhance Overwintering Hive Success Rates (Poster)
Research Collaborator(s): Kara Mallizzio
Faculty Mentor(s): Dr. Brad Mogen, Biology

Honey bees, Apis mellifera, are an incredibly important keystone species that are vital to our agricultural industry here in Wisconsin. Being at the heart of this multi-million dollar industry, bees serve an irreplaceable role as the main pollinators of many of our common cash crops. Unfortunately, for a variety of reasons, honey bee populations have begun to decline nationwide. Non-migratory honeybees, or bees that do not get moved to southern states to pollinate crops, are not surviving winters in Wisconsin as successfully as they have in the past. If selective breeding could produce honey bees that are able to survive the long, harsh winters this would significantly reduce the reliance on costly Southern bee packages. These better adapted bees would also safeguard the agricultural industries by ensuring less hive loss over the winter. Finding a viable and sustainable model for overwintering honey bees by using small nucleus (nuc) hives may greatly reduce these issues for the non-migratory beekeeper.

Fritze, August

2018 WSGC State and Midwest Regionals Collegiate Rocket Competition (Poster)
Research Collaborator(s): Farris Al-Humayani, Jose Bermeo, Justin Diercks, Robert Dietrich
Faculty Mentor(s): Dr. Glenn Spiczak, Physics

Last Spring, Team Falcon 1 made its fifth annual appearance at the Wisconsin Space Grant Consortium Collegiate Rocket Competition. After rigorous work being invested into the science behind rocketry, the team progressed to the Midwest Regionals competition! Observe a poster that expands on the basics behind the team's efforts in the 2015 competition along with photos, diagrams, and on-board footage of both launches.

Galde, Tyler

Using GPS to create high resolution terrain data (Poster)
Research Collaborator(s): Michael Wallace, Trent Gundrum
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

High resolution terrain data used for 3D mapping is scarce, and River Falls is no exception. In this project we made a more defined, higher resolution Digital Elevation Model (DEM) to see if it is possible to generate the information using a
hand held GPS receiver. We selected a location, in River falls near Lake Louise, where we collected elevation data every 5 meters with Garmin GPS receivers. The final DEM shows a high resolution elevation image. Overall, our process produced successful results, but more testing is necessary to further hone accuracy.

**Glowa, Kyle**

**White Tail Ridge Mountain Bike Map** (Poster)
Research Collaborator(s): Tucker Hagen, Cody Stencil, Alex Hamus
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

Whitetail Ridge Mountain Bike Trail, near River Falls, WI, is a popular destination for novice and advanced mountain bikers alike. The area currently has no up-to-date map with a detailed depiction of the separate trail sections. Trail data was collected by GPS fieldwork, digital camera and GoPro video over the course of two weeks. The final map aims to allow riders to better choose their path based on individual skill level.

**Grzybowski, Sammi**

**The Balloon Project** (Poster and balloon display)
Research Collaborator(s): Jason Blatz, Diego Valadares
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

Aerial photography has been used in city planning, wildlife protection, and agricultural research, among others. This project focuses on developing techniques in order to obtain quality imagery using a digital camera and helium balloon. The images were taken at Hoffman Park in River Falls, Wisconsin, where we collected data on three separate occasions. Following data collection, the images were processed and used in a Geographic Information System (GIS) as reference material for mapping.

**Gundrum, Trent**

**Using GPS to create high resolution terrain data** (Poster)
Research Collaborator(s): Tyler Galde, Michael Wallace
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

High resolution terrain data used for 3D mapping is scarce, and River Falls is no exception. In this project we made a more defined, higher resolution Digital Elevation Model (DEM) to see if it is possible to generate the information using a hand held GPS receiver. We selected a location, in River falls near Lake Louise, where we collected elevation data every 5 meters with Garmin GPS receivers. The final DEM shows a high resolution elevation image. Overall, our process
produced successful results, but more testing is necessary to further hone accuracy.

Hagen, Tucker

*White Tail Ridge Mountain Bike Map* (Poster)
Research Collaborator(s): Kyle Glowa, Cody Stencil, Alex Hamus
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

Whitetail Ridge Mountain Bike Trail, near River Falls, WI, is a popular destination for novice and advanced mountain bikers alike. The area currently has no up-to-date map with a detailed depiction of the separate trail sections. Trail data was collected by GPS fieldwork, digital camera and GoPro video over the course of two weeks. The final map aims to allow riders to better choose their path based on individual skill level.

Hammill, Peter

*The effects of positivity and work outcomes.* (Poster)
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

The effects of positive attitudes on work place outcomes. What does these attitudes do for work ethics and peoples ability to work better.

Hamus, Alex

*White Tail Ridge Mountain Bike Map* (Poster)
Research Collaborator(s): Tucker Hagen, Kyle Glowa, Cody Stencil
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

Whitetail Ridge Mountain Bike Trail, near River Falls, WI, is a popular destination for novice and advanced mountain bikers alike. The area currently has no up-to-date map with a detailed depiction of the separate trail sections. Trail data was collected by GPS fieldwork, digital camera and GoPro video over the course of two weeks. The final map aims to allow riders to better choose their path based on individual skill level.

Haugen, Owen

*Distribution and Spread Potential of Buckthorn and Garlic Mustard at Kinnickinnic River Access Points* (Poster)
Faculty Mentor(s): Dr. Jarod Blades, Plant and Earth Science

An invasive species survey focusing on two species Common Buckthorn (*Rhamnus cathartica*) and Garlic Mustard (*Alliaria petiolata*). The Area of focus for this study was along the banks of the Kinnickinnic river and a few points
along its tributaries. These points were selected before hand, with an emphasis on heavily accessed and easily accessible points along the river. These points were mapped using various maps, fishing guides, and colloquial information. Once the points of interest had been identified they were visited and photographed. A matrix ranking guide with general field descriptions was collected for each location. The ranking guide corresponded to a list of risk factors linked to a numerical representation. These digits were then added together to suggest a level of risk within an area. Once the potential risk level was tallied the site would receive a brief write up suggesting what future actions should be taken.

**Hayes, Charles**

*Analyzing the Effects of Cranberry Pollination on Honey Bee Hemolymph Cells* (Poster)

Faculty Mentor(s): Dr. Kim Mogen, Biology

The cranberry, Vaccinium macrocarpon, provides over $300 million dollars in revenue to Wisconsin annually. Wisconsin produces roughly 60% of the nation’s total cranberry crop. The cranberry plant is one of many crops that require insect pollination and typically honey bees, Apis mellifera, are the primary pollinators. Wisconsin beekeepers that pollinate the cranberry crop suggest that bees coming off of the crop are less healthy then bees foraging on native plants or bees pollinating other crops. The parameters that define a “healthy” bee are not defined. One approach is to look at the cells found in bee hemolymph (bee blood), which is considered to contain cells involved in immunity reactions. This study was conducted to compare the hemocyte profile of bees foraging on clover with those pollinating cranberries. Bees were collected before pollination and also two weeks after pollination. The bees’ hemolymph was analyzed with a flow cytometer to determine the quantity of each type of particle. The results show there is a wide variation amongst the number and type of particles in both sets of bees. There is no evidence suggesting that bees are less healthy coming off of the cranberry crop at this time.

**Hite, Rebbekah**

*Local Collaboration Project on Nitrogen Fixing Bacterium Inoculums for Potential Use in Seed Treatment for Crops* (Poster)

Research Collaborator(s): Samuel Barton
Faculty Mentor(s): Dr. Fred Bonilla, Biology

Exterior nitrogen fixation is an integral part of the nutrients needed by crops to grow and produce a viable harvest. The use of inoculums to coat a seed in prior to planting allows farmers to plant the bacteria that fix nitrogen from the environment into a carbon bound form that the crop can then absorb and process. Planting the two in tandem potentially creates some amount of resistance in the crop to environmental fluctuations that are potentially
damaging. Previous protocol established for testing B. japonicum effectiveness needed modifications to be used in an industrial setting. Research was done to further validate the methods used with their modifications, and a novel route of using Real Time PCR to test for bacterium quantities on seeds was evaluated against a standard curve. Our research presents our current findings and showcases a collaborative effort between a local River Falls business and UWRF for the enhancement of crop health through potential natural methods.

**Hoff, Brandi**

*Sexual Assault on College Campuses* (Poster)
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

I will be conducting a secondary data analysis using the ICPSR website, specifically, data from the prevalence and case characteristics of drug facilitated, incapacitated, and forcible rape among college students and other young women in the united states, 2006. I am interested in exploring three different questions; The correlation between mental health and drug/alcohol use/abuse, the correlation between drug/alcohol use/abuse and sexual assault, and the correlation between mental health and sexual assault among college women in the United States. I hypothesize that drug/alcohol use/abuse and mental health issues will correlate with sexual assault.

**Hotchkiss, Harley**

*Series of work: Titles: Exposed, Something Within, and Mass Production Mass Destruction* (Artwork)
Faculty Mentor(s): Eoin Breadon, Art

My passion for art and the military has been a large part of my life, and both have influenced each other in significant ways. Both are very different, but do have similarities with the successes and losses that you encounter.

I have numerous family members and friends that have served and have seen what war does to the human soul. For many, it is the negative experiences, and how they haven’t been brought to the surface and can be very dark. The largest instrument employed in the most current war on terror is an Improvised Explosive Device (IEDs). These IEDs predominantly use 155mm mortar rounds to rip through amour of vehicles and incinerate human flesh. Having served as in infantryman in 2004, in Samarra Iraq, I witnessed how this one round not only affects the individual it comes in contact with physically, emotionally, and socially, but also the people closest to that person.

Tragically 22 veterans commit suicide each day, which means 8,030 veterans take their lives every year. To expose the raw truth behind war and its after-effects, I use the 155mm mortar round to symbolize the start of the roller coaster of effects on those that encounter it. These blown glass mortars
represent the loss of each veteran we lose to suicide and signify not only the loss of life, but also the emotional toll in which Post Traumatic Stress Disorder embeds itself into each soldier. It is not only the physical aftermath of war, but at times it is the lethal unresolved mental health aftereffects that all too often go unacknowledged and untreated.

With glass I can reveal the transparency and fragility of the subject and immerse the viewer into the piece itself. In using a blow mold to make multiple identical pieces, the glass will show the subtle differences through the optics and light that it captures that other mediums cannot show. The differences in the physical properties of glass, being both strong yet vulnerable, parallel my thinking about soldiers.

Howell, Sydney

*The Dam Decision* (Short Film)
Faculty Mentor(s): Joe Blum, Stage and Screen Arts

The city of River Falls currently has two dams in town that impound the Kinnickinnic River. The dams hold a historic value as River Falls was founded as a milling community and the dams produce locally made hydro-electrical energy. However, the dams also impact the Kinni’s trout population, build up sediment deposits, and remove the possibility of a waterfall in town. The opportunity for dam removal or re-licensing came about in 2013 when the city was notified that their governmental dam license was due for renewal. My documentary short presents the cost and benefits of the dams, and aims to inform the community about what is happening in their city: to remove the dams or re-license, that is the question.

Huth, Rebecca

*An Investigation of the Perceived Importance and Inclusion of Music Standards within Minnesota and Wisconsin Classrooms* (Poster)
Research Collaborator(s): Ryan Nattrass, Richard Thomas, Dillon Chieves
Faculty Mentor(s): Dr. Paul Budde, Music

The purpose (objective) of this study “is to gather information from current music educators in Minnesota and Wisconsin regarding their attitudes about and implementation of state and national music standards within their classrooms.”

Our research will be conducted via an online survey sent to approximately 5500 music educators in Wisconsin and Minnesota (roughly 2700 in Minnesota and 2800 in Wisconsin, per the estimates given by the Minnesota Music Educators Association and Wisconsin Music Educators Association). The survey will be distributed this school year, with a target of mid-January 2016.
With the information gathered from the survey, the goal of this project is to discover whether there is a correlation between a music educator’s (a) gender, (b) age, (c) school setting (rural-urban-suburban), (d) classes taught (band-choir-orchestra-classroom music-other) (e) grade level taught (K-12), (f) teaching experience (years), or (g) highest degree earned regarding the value that s/he associates with the inclusion of specific music standards when constructing daily lesson plans, regarding his/her knowledge about State (Minnesota and Wisconsin) and National (1994 and 2014) music standards, and regarding his/her inclusion of specific music standards within daily lesson plans?

**Jae, Katie**

*Departure Breath* (Artwork)
Faculty Mentor(s): Rhonda Willers, Art

I create organically hybrid ceramic forms that render characteristics of nature and human in relation to the constant transformation of being and becoming overtime within existence through experiences.

**Jae, Katie**

*Quiet Beings* (Artwork)
Faculty Mentor(s): Rhonda Willers, Art

I am to create forms reminiscent of the quietness found within nature. These forms relate to subtle interactions throughout nature creating a curious contemplation for whoever encounters their happening.

**Janke, Amanda**

*Effects of chronic stress on nicotine-seeking behavior and reinstatement* (Poster)
Research Collaborator(s): Mariah Lynum
Faculty Mentor(s): Dr. James Cortright, Psychology

Drug addiction is a major public health and serious economic concern in the United States costing taxpayers billions of dollars annually. Experimental evidence shows that exposure to stress is not only a factor in the development of addiction; but also a trigger for drug relapse, or reinstatement. As tobacco use has been linked to a number of cancers and represents the leading cause of preventable death in the United States, elucidation of the effects of stress on nicotine-seeking behavior and relapse is critical. A critical role of chronic stress in the compulsion to seek tobacco and other nicotine delivering products has long been suspected. Although many studies have provided compelling evidence for a role of chronic stress in the enhanced sensitivity to cocaine-seeking behavior and relapse, few have assessed the contribution of chronic stress on nicotine-seeking behavior. In fact, stress induced cross-sensitization to nicotine remains controversial. Additionally, there have been no studies investigating the
effects of chronic stress on nicotine-seeking relapse, or reinstatement. Thus, these experiments assess the ability of repeated exposure to variable stress to augment nicotine-seeking behavior and relapse in an animal model of drug addiction. Male Long-Evans rats were exposed to variable stress that consisted of the exposure to different stressors in random order for 14 days. During this period the control group was left undisturbed except for cage cleaning. Rats were allowed to self-administer nicotine (0.03 mg/kg/infusion) under fixed ratio schedules of reinforcement across 15 consecutive daily sessions. Responding under a progressive ratio schedule of reinforcement was assessed over the following six daily sessions. This schedule allows for break points to be analyzed, a measure that reflects the motivation to self-administer nicotine. Following up to 20 days of extinction training, rats were tested for nicotine-seeking behavior reinstatement by a non-contingent injection of nicotine (0.4 mg/kg, IP). Rats exposed to chronic stress acquired nicotine self-administration at a faster rate relative to controls, exhibited enhanced motivation to obtain the drug, and were more resistant to nicotine extinction. Further, we hypothesize that exposure to chronic variable stress will lead to enhancements in nicotine-primed reinstatement, or relapse. Collectively, these findings indicate that chronic stress can enhance the motivational effects of nicotine.

Johnson, Kyle

*Family Life, Well-being, and Human Service Funding* (Poster)

Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

My goal with this project is to expand understanding of family well-being by analyzing qualitative data from parents of dependents with DD (developmental disability) diagnosis. This project is designed to gather family quality of life information using one on one interviews with parents of dependents with developmental disabilities, and analyze the data using domain and taxonomic coding. I will examine family quality of life indicators that take the family group as its focus, this approach is opposed to individual quality of life indicators that focus on each person separately from the family group. There are several family quality of life scales in use currently by researchers to study the intersection of quality of life and support services for people with developmental disabilities. This project will make use of the Beach Center Family Quality of Life sub-scales as domains, and taxonomic coding will uncover the concepts and ideas people use to interpret their life experiences and provide a qualitative story-line for family stability. I hope to expand the current knowledge by coding qualitative data to add its depth and richness to quantitative analysis of family life in families with developmentally disabled offspring.

Johnson, Emily

*Do Situation Cues in a Training Climate Affect Performance?* (Poster)
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

This study is specifically going to be looking at whether or not two of the situation cues, goal and task cues, help increase performance by putting them in the training, instead of using the cues post-training like most research has done. There will be a teacher, who gets trained by the researcher, and learners who will get trained by the teachers. Performance will be evaluated by teaching ability, as well as a demonstration by the learner.

**Jorgensen, Henrik**

*Goblet Study* (Artwork)
Faculty Mentor(s): Eoin Breadon, Art

Throughout the semester, I have been working with different applications of colors and forms to apply the colors to. These goblets were a transgression of my studies consisting of form, color and influence.

**Jorgensen, Henrik**

*Earth Tone Bottles* (Artwork)
Faculty Mentor(s): Eoin Breadon, Art

The appearance of a tall skinny neck on a bottle or vase form has always attracted me. These bottles were a small series that were created in practicing this technique and figuring out the size relation between the neck and body.

**Jorgensen, Henrik**

*Face the Light* (Artwork)
Faculty Mentor(s): Eoin Breadon, Art

Face the Light was an exploration piece of the process of casting and creating a way to display the glass face. The project allowed me to experiment with a light up piece and different style framing and display. The piece ultimately gave me a chance to try a new form and stand to allow myself to change and apply different concepts and meaning to as I move forward with my work.

**Juelfs, Jacob**

*Islamophobia: the discrimination and prejudice experienced by Muslims* (Poster)
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

This Study is designed to explore the heightened fear of Muslims and those of the Islamic belief, among Current day post 9/11 non-Muslim Americans. This study will aim to answer three questions; 1) what level of discrimination are Muslim or/and Islamic Americans in or near the Twin Cities experiencing, 2) is it
common for many non-Muslims or Islamic Americans to hold prejudices against people who look to be Muslim or Islamic, 3) and Finally, how well educationally based are these prejudices if there are any, or do those prejudices hold any merit?

Kerr, Elliot

*Reach Out PSA* (Short Film)
Faculty Mentor(s): Erik Johnson, Stage and Screen Arts

A 1:30 second PSA about the lack of mental health facilities in St. Croix County.

Kiss, Cody

*Witch of the Wilds* (Artwork)
Faculty Mentor(s): Peter Mak, Art

Witch of the Wilds is a piece that I did to show some of my Pagan roots. The woman holds a deer skull in front of her face, making the woman anonymous, and thus a relation to anyone, not just one specific person. I chose the landscape to show my heritage, namely Danish and Swedish. The true meaning of the piece though? That's for the viewer to decide. For some it's a symbolical piece relating back to mental health, for others it represents hiding one's true feelings. I myself find all of these thoughts valid.

Kriese, Ellie

*Identification and Characterization of Soil Bacteriophage Barretlemon Infecting Arthrobactacter sp.* (Poster)
Faculty Mentor(s): Dr. Karen Klyczek, Biology

The discovery of the bacteriophage BarretLemon began in 2013, with the collection of a soil sample from Chippewa Falls, Wisconsin. Viruses infecting Arthrobacter bacteria were isolated from the soil. DNA was collected from the phage and sequenced. We annotated the genes using DNA master and determined possible functions for the genes using HHPred. The purpose for annotating the genes of Barretlemon was to find more information about this unique phage and be able to compare the features of this phage to other Arthrobacter phages as well as all phages in the phage database. Barretlemon was concluded to be a unique phage based on plaque morphology, EM pictures, and the DNA sequence. All final findings are posted in the online Actinobacteriphage database.

Lammers, Shea

*The Effects of a Community Parent Education Class on Parents of Infants* (Poster)
Research Collaborator(s): Abigail Ritsch, Alexis Sliva
Faculty Mentor(s): Dr. Melanie Ayres, Psychology
The purpose of this study was to examine the effects of a free parent education class offered by a resource center across three different counties in the Wisconsin area. Parents were asked to complete a pre and post survey which primarily assessed risk (e.g., parenting stress) and protective (e.g., social support) factors associated with child abuse and neglect. We hypothesized that program involvement would lead to an increase protective factors and decrease risk factors. Our findings partially supported our hypothesis in that there was a reduction in the risk factor we assessed, as well as an increase in one of protective factors assessed.

Lammers, Shea

*Exploratory Survey: Child Digital Media Exposure and Parent Motivations* (Poster)
Research Collaborator(s): Claire Wiechman
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

Despite recommendations from the American Academy of Pediatrics (AAP) to limit digital media exposure, many children under 2 years are regularly exposed to various types of digital media, such as television, tablets, and mobile devices (Rideout & Hamel, 2006). This project expands on past research examining correlations between parent motivation and child television viewing (Cingel & Krcmar, 2013), as well as research that examines parent demographic and attitude predictors of amount of child media use (Lauricella, Wartella, & Rideout, 2015). This study explores parent motivations for child media exposure, as well as parent awareness of AAP media recommendations. The study assesses parent demographics and their relationship to child media use. The researchers also explored whether parents have conflicting feelings about their child’s media use and their awareness of AAP media recommendations.

LaPitz, Alexandra

*The Effects of Inhibition of the Medial Prefrontal Cortex on Symptoms of Depression in an Animal Model* (Poster)
Research Collaborator(s): Anna Miller
Faculty Mentor(s): Dr. James Cortright, Psychology

Depression is the most widespread disability on Earth affecting more than 350 million people of all ages across the globe (World Health Organization, 2015). Depression mostly affects women and can lead to self-injury, substance abuse, and even suicide (World Health Organization, 2015). The gravity of these consequences indicates that depression is a mental illness which can alter an individual’s self-esteem or self-focus. Self-focus (i.e. the process by which one engages oneself in self-referential processing) is a core issue in the psychopathology of major depression (Lemogne, Delaveau, Freton, Guionnet, & Fossati, 2012). Previous studies have used functional neuroimaging to identify that the cortical midline structures, including the medial prefrontal cortex
(MPFC), play a key role in self-referential processing in depressed subjects (Elliott, & Dolan, 2003; Lemongne et al., 2012). This research holds significance in that it builds on previous findings that have aimed to link specific patterns of activity to specific areas of the prefrontal cortex as mediating symptoms of depression with conflicting results. Further examination of the medial prefrontal cortex is warranted not only as a possible precursor to the implication of its involvement in mediating depression but also in order to provide support for a dominant pattern of brain activity (inhibition) which interacts with symptoms of depression.

The current study aims to look at drug-induced medial prefrontal cortex inhibition in animal models of depression. The study uses an animal model of learned helplessness, lethargy and anhedonia as a measure of self-referential processing in depression. In order to maintain high external validity the proposed study will utilize female Long Evans rats in order to more accurately generalize findings to the population of women which make up the majority of depressed individuals in humans. Subjects will be tested for latency in regards to learned helplessness, for lethargy in a radial arm maze and open field test, and for anhedonia using sugar pellets. It is hypothesized that a decrease in learned helplessness, lethargy, and anhedonia will be seen in animals which exhibit depressive symptoms that have undergone inhibition of the medial prefrontal cortex (having also had their self-referential processes inhibited) compared to animals which display symptoms of depression but do not receive this treatment.

Lawson, Temiloluwa

*Ebola: Not just a Biological Problem but a sociological one too.* (Poster)

Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

Ebola is a deadly viral disease that affected parts of Central and West Africa. There is no known cure, but it continues to be heavily studied. It is a mystery to many why certain countries were affected worse than others. This study is a qualitative study of Ebola. More specifically, I examined the social response to the disease and the factors associated with people’s response to Ebola. To gather this information, I conducted several open ended interviews, with a sample of Liberians, Medical professionals, response teams etc. living in the Minneapolis/Saint Paul area. I will used a sample of interview questions, but was also flexible during the interview allowing the respondent to take the interview in interesting but anticipated directions.

Loureiro, Ronaldo

*Modeling artificial “normal” and cancerous breast ductal tissues using the new Cell-MateTM 3D matrix material.* (Poster)

Faculty Mentor(s): Dr. Timothy Lyden, Biology
In collaboration with BRTI Lifesciences, LLC., the UWRF TCIC has been engaged in testing and evaluating a new synthetic 3D tissue engineering matrix material product called Cell-Mate. This new material is based on a combination of hyaluronic acid and chitosan which yields a final matrix gel that enmeshes cells at relatively high densities to generate artificial tissues. In this series of studies, breast ductal adenocarcinoma cells (MCF-7) and “normal” breast ductal cells (MCF10A) were employed to generate significant artificial tissues (ATs) based on the application of Cell-Mate. MCF-7 ATs were generated from 40, 20 and 10 million cells respectively and MCF10A ATs were generated from 20 and 10 million cells. In all cases, successful ATs resulted with significant areas of tissue or tumor-like architecture and distinct evidence of cellular differentiation as well as tumor cell progression. MCF-7 ATs generated evidence of tumor progression and eventual metastasis-related spheroid, cluster and single cell release. In the case of 40 million cell seeding loads, spheroid production occurred within the first week of culture while at 20 and 10 million cell loads the timing of spheroid generation/release was significantly longer at 2-3 weeks. However, within the first week, 20 million and 10 million cell loads did show definitive rounded features on the surfaces of the developing ATs. Interestingly, some cluster generation was seen in the “normal” MCF10A cell line ATs as well, but at a much lower level. Also in the case of MCF10A, shed cells formed monolayers in the bottom of culture wells which displayed differentiation-associated cells and colonies after 2-3 weeks of ATs development. These cells contrasted distinctly from those seen in the original culture monolayers which strongly supports the interpretation that ATs microenvironments induce pathway specific changes in cellular behaviors. Continuing studies are evaluating the morphology and marker expression profiles of tissues within the generated ATs as well as examining and comparing Cell-Mate generated MCF-7 spheroids in contrast to media induced or hanging drop culture generated spheroids. Based on studies to date, we propose the application of Cell-Mate as an effective approach to modeling breast cancer tumors in-vitro and expect that this will open the door to better understanding of the role of microenvironments in tumor progression generally.

Luedtke, Timothy

Slipcast Porcelain Wares (Artwork)
Faculty Mentor(s): Randy Johnston, Art; Rhonda Willers, Art; Mike Helke, Art

Slipcasting is a production technique used for creating and repeating forms which would be too time consuming or impossible to create using a potter’s wheel. Using the technique of slipcasting, I create objects for various areas of our lives focusing on both form and function.
Lusardi, Laura

*Observation of the Cosmic Ray Shadows of the Sun and Moon with IceCube* (Poster)
Faculty Mentor(s): Dr. Surujhdeo Seunarine, Physics

We report on a study of the effects of the moon and sun on the event rate within the IceCube detector. IceCube is a neutrino telescope constructed deep within the Antarctic ice. The detector utilizes 5,160 light sensors deployed in a cubic-kilometer of ice to record the light produced by relativistic, charged particles that are produced by cosmic ray and neutrino interactions. IceCube’s main goal is to detect high-energy extraterrestrial neutrinos spawning from sources such as active galactic nuclei, gamma ray bursts, and supernovae. Monitoring both the sun and the moon’s cosmic ray shadows is an important tool for the detector’s angular calibration. These shadows may also provide new insight into cosmic phenomena by measuring the consistency of the moon shadow, the fluctuations in the sun shadow, and the number of cosmic rays reaching the detector. These studies may hold important implications for the future of the detector, as well as for solar physics.

Lynum, Mariah

*Effects of chronic stress on nicotine-seeking behavior and reinstatement* (Poster)
Research Collaborator(s): Amanda Janke
Faculty Mentor(s): Dr. James Cortright, Psychology

Drug addiction is a major public health and serious economic concern in the United States costing taxpayers billions of dollars annually. Experimental evidence shows that exposure to stress is not only a factor in the development of addiction; but also a trigger for drug relapse, or reinstatement. As tobacco use has been linked to a number of cancers and represents the leading cause of preventable death in the United States, elucidation of the effects of stress on nicotine-seeking behavior and relapse is critical. A critical role of chronic stress in the compulsion to seek tobacco and other nicotine delivering products has long been suspected. Although many studies have provided compelling evidence for a role of chronic stress in the enhanced sensitivity to cocaine-seeking behavior and relapse, few have assessed the contribution of chronic stress on nicotine-seeking behavior. In fact, stress induced cross-sensitization to nicotine remains controversial. Additionally, there have been no studies investigating the effects of chronic stress on nicotine-seeking relapse, or reinstatement. Thus, these experiments assess the ability of repeated exposure to variable stress to augment nicotine-seeking behavior and relapse in an animal model of drug addiction. Male Long-Evans rats were exposed to variable stress that consisted of the exposure to different stressors in random order for 14 days. During this period the control group was left undisturbed except for cage cleaning. Rats
were allowed to self-administer nicotine (0.03 mg/kg/infusion) under fixed ratio schedules of reinforcement across 15 consecutive daily sessions. Responding under a progressive ratio schedule of reinforcement was assessed over the following six daily sessions. This schedule allows for break points to be analyzed, a measure that reflects the motivation to self-administer nicotine. Following up to 20 days of extinction training, rats were tested for nicotine-seeking behavior reinstatement by a non-contingent injection of nicotine (0.4 mg/kg, IP). Rats exposed to chronic stress acquired nicotine self-administration at a faster rate relative to controls, exhibited enhanced motivation to obtain the drug, and were more resistant to nicotine extinction. Further, we hypothesize that exposure to chronic variable stress will lead to enhancements in nicotine-primed reinstatement, or relapse. Collectively, these findings indicate that chronic stress can enhance the motivational effects of nicotine.

**Mallizzio, Kara**

*Preparing to Establish the First Honeybee "Sentinel Hive Apiary" in the State of Wisconsin* (Poster)

Faculty Mentor(s): Dr. Brad Mogen, Biology

Beekeepers in the United States lose approximately 30% of their hives each year due to disease, pests, and winter kill. Regional Management Programs (RPM’s) are being encouraged to reduce these losses. RPM’s are a strategy whereby ALL beekeepers in a given area monitor and treat their colonies for common problems in a coordinated manner to have the greatest positive aggregate effect. “Sentinel Hives” are a key feature of this approach. Sentinel Hives are established in an apiary and used to monitor nectar flows, pollen collection, and are routinely tested for important honey bee diseases and pests. Real-time data obtained from Sentinel Hives will be uploaded and made available online through a collaboration with the University of Maryland. Regional beekeepers can access this data, allowing them to make better management decisions for feeding and treatment regimens for diseases and pests.

**Mallizzio, Kara**

*Testing Whether Nucleus Honeybee Colonies Enhance Overwintering Hive Success Rates* (Poster)

Research Collaborator(s): Jared Fitzenberger

Faculty Mentor(s): Dr. Brad Mogen, Biology

Honey bees, Apis mellifera, are an incredibly important keystone species that are vital to our agricultural industry here in Wisconsin. Being at the heart of this multi-million dollar industry, bees serve an irreplaceable role as the main pollinators of many of our common cash crops. Unfortunately, for a variety of reasons, honey bee populations have begun to decline nationwide. Non-nomigratory honeybees, or bees that do not get moved to southern states to pollinate crops, are not surviving winters in Wisconsin as successfully as they
have in the past. If selective breeding could produce honey bees that are able to survive the long, harsh winters this would significantly reduce the reliance on costly Southern bee packages. These better adapted bees would also safeguard the agricultural industries by ensuring less hive loss over the winter. Finding a viable and sustainable model for overwintering honey bees by using small nucleus (nuc) hives may greatly reduce these issues for the non-migratory beekeeper.

**Martin, Miranda**

*Are there Differences in Immune Cell Profiles Between Worker (female) and Drone (Male) Honey Bees? (Poster)*

Faculty Mentor(s): Dr. Brad Mogen, Biology

The honey bee, *Apis mellifera*, has become increasingly well known for its importance in pollination and its value in the honey, wax, and royal jelly it produces. Due to world-wide dependence on these bees, concern for the health of *A. mellifera* has also increased as unusually large hive losses have been recently observed. Originally, we intended to compare immune cell profiles of worker honey bees of different ages, castes, and genotypes. Due to weak growth of the test hives, young bees were unable to be sampled as hives had to be supplemented with any available frames of brood, causing an uncertain admixture of genotypes within the hives. Male bees, known as drones, and female worker bees can easily be separated and sampled to compare their hemocyte profiles with a high degree of certainty. After analyzing samples by flow cytometry, visible differences in the profiles between workers and drones became apparent. Worker bees showed a clustering of cell types in the shape of a whip-like tail while drones showed a less organized array of cell types scattered across a larger area of the plot.

**Matz, Risa**

*eve (Artwork)*

Faculty Mentor(s): Dan Paulus, Art

Environmentalism has become a cliché, a hippie lifestyle, or catchphrase for profit leveraging. We talk about the environment as something to balance with the social and economic sectors of society, as if it were all equal. We talk about it as something we can distance ourselves from. Our separate, sterile, homes convince us that we are safe. The wild is out there and we are in here. Ironically, we were never separate from the wild, it is in us and it is us. Though we try to clean it off, our bodies depend on bacteria to live. We try to purify our air, but plants will always do a better job. We are born from the earth and will always return to it. I truly believe that to solve any problem in the world we must first start with supporting that which supports us: the environment, Mother Earth, Eden. My digital artwork illustrates this complex relationship we have with nature.
McArthur, Mollie

*Saving Native Pollinators with Seed Bombs* (Poster)
Faculty Mentor(s): Dr. Karen Klyczek, Biology

Native species in North America are dwindling due to a decrease in native pollinators and land availability. Since the 2014 fall gala I have been collaborating with Plantables LLC to experiment on our ideas to improve their product called seed bombs. Seed bombs is a product that is originally made from two parts clay and one part compost containing various seeds of native wildflowers. Through my research over the summer we discovered that a substrate called coir works well to increase germination rates and now the recipe has changed to incorporate that substrate. This is one of the many conclusions that we have reached through my research conducted this previous summer. By improving germination rates for easy to use throwable seed bombs we are increasing our chances of turning the tides and saving native pollinators by increasing native wildflowers. Home growing gardeners and company owners alike are both able to do their part in this recovery while saving time, money, and resources.

McConnell, Cody

*Perceptions of CCTV in the U.K. and U.S. within College Student Populations.* (Poster)
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

Qualitative research developed within the U.K. and U.S. for the purposes of understanding perceptions of CCTV within college student populations regarding fear of victimization, support for CCTV and the possible future outcomes for the increased comfort with surveillance technology throughout the developed world.

Miller, Anna

*The Effects of Inhibition of the Medial Prefrontal Cortex on Symptoms of Depression in an Animal Model* (Poster)
Research Collaborator(s): Alexandra LaPitz
Faculty Mentor(s): Dr. James Cortright, Psychology

Depression is the most widespread disability on Earth affecting more than 350 million people of all ages across the globe (World Health Organization, 2015). Depression mostly affects women and can lead to self-injury, substance abuse, and even suicide (World Health Organization, 2015). The gravity of these consequences indicates that depression is a mental illness which can alter an individual’s self-esteem or self-focus. Self-focus (i.e. the process by which one engages oneself in self-referential processing) is a core issue in the
psychopathology of major depression (Lemogne, Delaveau, Freton, Guionnet, & Fossati, 2012). Previous studies have used functional neuroimaging to identify that the cortical midline structures, including the medial prefrontal cortex (MPFC), play a key role in self-referential processing in depressed subjects (Elliott, & Dolan, 2003; Lemongne et al., 2012). This research holds significance in that it builds on previous findings that have aimed to link specific patterns of activity to specific areas of the prefrontal cortex as mediating symptoms of depression with conflicting results. Further examination of the medial prefrontal cortex is warranted not only as a possible precursor to the implication of its involvement in mediating depression but also in order to provide support for a dominant pattern of brain activity (inhibition) which interacts with symptoms of depression.

The current study aims to look at drug-induced medial prefrontal cortex inhibition in animal models of depression. The study uses an animal model of learned helplessness, lethargy and anhedonia as a measure of self-referential processing in depression. In order to maintain high external validity the proposed study will utilize female Long Evans rats in order to more accurately generalize findings to the population of women which make up the majority of depressed individuals in humans. Subjects will be tested for latency in regards to learned helplessness, for lethargy in a radial arm maze and open field test, and for anhedonia using sugar pellets. It is hypothesized that a decrease in learned helplessness, lethargy, and anhedonia will be seen in animals which exhibit depressive symptoms that have undergone inhibition of the medial prefrontal cortex (having also had their self-referential processes inhibited) compared to animals which display symptoms of depression but do not receive this treatment.

**Miotke, Alison**

*The Impact of a Living Greenwall on Student Attitudes, Moods, and Academic Performance* (Poster)

Faculty Mentor(s): Dr. Travis Tubre, Psychology; Dr. Terry Ferriss, Plant and Earth Science; Dr. David Trechter, Agricultural Economics

Research from multiple disciplines suggests that the physical environment in which an individual lives and works can impact their lifestyle, health, well-being, and productivity. Studies conducted in office and academic settings in such diverse locations as Japan (Shibata & Suzuki, 2004), the UK (Knight & Haslam, 2010), and the Netherlands (Nieuwenhuis et. al., 2014) have consistently demonstrated that indoor plants positively impact student and worker moods, attitudes, and productivity. The goal of our research was to extend on this previous research by studying whether these same benefits would be seen for a Greenwall (i.e., a vertically arranged, living wall of plants) that is built into the physical environment of a classroom. To confirm the initial equivalence of the room targeted for the Greenwall installation and the control classroom, we ran
a series of experimental sessions, where student participants completed survey measures on mood, attitudes and performance after being randomly assigned to either the target room for the Greenwall or the control classroom. All pre-existing differences were either non-significant or favored the control room. Following the installation of the Greenwall, we repeated the process, examining differences between the Greenwall-enhanced room and the control room. Overall, we found that both general and performance-related environmental perceptions were significantly higher in the Greenwall-enhanced classroom. Our results could be beneficial to academic and professional organizations looking for evidence-based environmental designs that optimize student and worker well-being.

**Miyabe, Flavia**

*Characterization of phage Toulouse infecting Arthrobacter hosts*  
(Poster)  
Faculty Mentor(s): Dr. Karen Klyczek, Biology

Toulouse is a bacteriophage that infects Arthrobacter sp. ATCC 21022. This phage was found in 2013, in Hudson, WI, by a UWRF student in a program called SEA-PHAGES. The phage genome has been sequenced and it has 15319 bp and 25 genes.

Toulouse is a temperate phage, which means that it is able to replicate either by a lytic cycle causing lysis of host cell, or by a lysogenic cycle in which the phage genome integrates as a prophage into the host cell DNA. However, the lysogenic cycle of Toulouse seems to be different from other phages. The goal of our research project is to analyze the characteristics of phage Toulouse focusing on its mechanism of lysogeny. These analysis include plaque morphology, growth characteristics of lysogen colonies, immunity testing, PCR using different primers, and genome sequencing analysis.

**Mohn, Tal**

*Adult astrogenesis in the cortex: a review*  
(Poster)  
Faculty Mentor(s): Dr. Andrew Koob, Biology

Astrocytes contribute to central nervous system function and organismal behavior, and are responsible for maintaining osmotic and ionic homeostasis of the brain. New evidence has implicated astrocyte dysfunction in a variety of disease states. One such process is reactive astrogliosis, which is a hallmark of astrocytes that occurs during injury and degeneration to the nervous system. Reactive astrogliosis is now known to stimulate adult astrogenesis in the cortex, and the exact extracellular perturbations that result in astrogenesis are unknown. Other cells are also believed to have an adult astrogenic fate, and here we review the current literature of the cellular basis for adult astrogenesis in the cortex.
Nattrass, Ryan

An Investigation of the Perceived Importance and Inclusion of Music Standards within Minnesota and Wisconsin Classrooms (Poster)
Research Collaborator(s): Rebecca Huth, Richard Thomas, Dillon Chieves
Faculty Mentor(s): Dr. Paul Budde, Music

The purpose (objective) of this study “is to gather information from current music educators in Minnesota and Wisconsin regarding their attitudes about and implementation of state and national music standards within their classrooms.”

Our research will be conducted via an online survey sent to approximately 5500 music educators in Wisconsin and Minnesota (roughly 2700 in Minnesota and 2800 in Wisconsin, per the estimates given by the Minnesota Music Educators Association and Wisconsin Music Educators Association). The survey will be distributed this school year, with a target of mid-January 2016.

With the information gathered from the survey, the goal of this project is to discover whether there a correlation between a music educator’s (a) gender, (b) age, (c) school setting (rural-urban-suburban), (d) classes taught (band-choir-orchestra-classroom music-other) (e) grade level taught (K-12), (f) teaching experience (years), or (g) highest degree earned regarding the value that s/he associates with the inclusion of specific music standards when constructing daily lesson plans, regarding his/her knowledge about State (Minnesota and Wisconsin) and National (1994 and 2014) music standards, and regarding his/her inclusion of specific music standards within daily lesson plans?

Ness, Delaney

The Stigmatization of Mental Illness Amongst College Students (Poster)
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

This study is designed to look at what the current stigma is towards people with mental illnesses according to college students and does it affect the way they treat others with mental illness? How they learned to have these attitudes is also important to figure out the root of the problem. Thus, has their outlook been influenced by media (i.e. magazines, movies, news, etc.) or institutions (i.e. family, peers, etc.)? I want to discover how our ideas alter our actions towards people with mental illnesses, such as depression, anxiety, and bipolar disorder. Basing this idea off of the symbolic interactionist theory, which suggests that we are influenced by social interactions and greatly affected by the opinion of others.

Olivier, Madeline

Teuchtar (Artwork)
Faculty Mentor(s): Peter Mak, Art

The painting includes three wooden panels connected by copper wire. It is an abstracted land mass of Scotland with texural aspects to represent variations in the highlands and lowlands.

Peake, John

*College student's perception of the police and what formed those views.* (Poster)

Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

I will be interviewing college students and asking them questions relating to the police. Once I have done that I will try to find out where those views came from. I will also have literature review to go with my report.

Pedek, Samantha

*Characterizing the Emission from Light Emitting Diodes in IceCube cDOMs* (Poster)

Research Collaborator(s): Robert Zill

Faculty Mentor(s): Dr. James Madsen, Physics; Dr. Surujhdeo Seunarine, Physics; Dr. Lowell McCann, Physics

IceCube is a one cubic kilometer neutrino telescope located deep within the Antarctic ice. It is a new type of telescope designed to study the Universe using neutrinos, an electrically neutral, nearly massless particle that is emitted from energetic objects like supernovas and active galactic nuclei. Neutrinos are detected indirectly by the light emitted when they interact in the volume of ice observed by IceCube. The light emitted can be detected by the thousands of light sensors called DOMs (Digital Optical Modules) that make up IceCube. Most DOMs are equipped with twelve identical Light Emitting Diodes (LEDs) used for calibrating the detector and the properties of the ice within the detector’s sensitive volume. A few DOMs, cDOMs (Color Digital Optical Modules), are fitted with LEDs of four different wavelengths. In this study, we determined different properties of the LEDs in a cDOM including the peak wavelength, spectral width, absolute intensity, and angular emission profile of each LED. These results will be used to better understand the data taken when the cDOM LEDs are flashed and will improve our understanding of the wavelength dependence of detector response and ice properties.

Pessoa, Lindomar

*Comparative Analysis of Breast Cancer Mammospheres Derived from Induced 3D Artificial Tissues and Hanging Drop Cultures.* (Poster)

Faculty Mentor(s): Dr. Timothy Lyden, Biology
According to American Cancer Society statistics, breast cancer was the leading type of new cancer cases reported for women during 2013. In that year, it represented 29% of new cases reported, while it was the second leading cause of cancer deaths among women. As with most cancers, breast cancer generally causes death by a process called metastatic spread. In this pathologic process cells or clusters of cells detach from the original primary tumor and exit into body fluids, eventually entering the blood stream and traveling to distant locations where it then establishes new secondary tumors. This process is the common cause of mortality in almost all types of cancer. Despite many decades of study and experimentation, a great deal is still not understood concerning the mechanisms responsible for this cellular behavior. In order to address this lack of understanding, our laboratory has been applying 3D culture techniques in order to develop modeling systems which replicate natural physiologic conditions in the body. In this work we have been studying the breast adenocarcinoma cell line MCF7, which, under certain conditions, will generate cellular spheroids displaying many characteristics in common with invasive metastases. Particularly, in this presentation we report on continuing studies comparing and contrasting the characteristics, population dynamics, structural details and invasive potential of spheres generated by media induction of 3D artificial tumor tissues produced with the MCF7 cell line and those spheroids produced with a recently developed “hanging drop” technique. These two approaches generate distinct populations of spheres which seem to share many attributes. Preliminary and ongoing studies have already demonstrated that these spheres reflect the metastatic process in many ways and therefore represents an excellent modeling system. The current work reported here focuses on internal spheroid structural details, stromal tissue attachment and subsequent cellular invasion. Future projects will build on these observations to examined potential pathways for blockage or inhibition of those invasive processes.

Rapoport, Holly

"Asphyxiation" (Artwork)
Faculty Mentor(s): Bernice Ficek-Swenson, Art

"Asphyxiation" is the first in a three part series titled "Things That Are Killing Me." This piece explores tobacco use. The series of self portraits focuses on mortality and the consequences of how we treat our bodies.

Regnier, Marie

An Examination of Gratitude and Generosity as Causes of Increased Happiness (Poster)
Faculty Mentor(s): Dr. Rik Seefeldt, Psychology

If feelings are the consequences, not the motivating causes of our behavior (Schnall & Laird, 2003, p. 787), can happiness be increased through our own
conscious behavior? The current study investigated the effects of the practice of gratitude and generosity on happiness levels with the hypotheses that practicing either gratitude or generosity would increase participants’ happiness and that practicing both gratitude and generosity together would result in an even greater happiness increase. Four experimental conditions were created. Participants practiced thoughtfulness in the control condition; mental gratitude in the gratitude condition; generosity in action, word, and ‘from the inside’ in the generosity condition; and the exercises of both the gratitude and generosity groups in the gratitude + generosity condition. All participants then completed a measure of authentic-durable happiness and a measure of fluctuating happiness. Participants were also asked to identify their level of religious commitment. Results found no statistically significant difference between condition mean happiness scores. Because the current results are not consistent with previous research, possible limitations to the current study are discussed. A significant happiness difference was found for religious commitment, with participants of high religious commitment reporting significantly more authentic-durable happiness than participants of low religious commitment. Practical happiness-increasing suggestions from positive psychology research are discussed.

Reh, Coty

**Discourses on Environmental Sustainability: The Processes and Contexts that Shape Sustainable Values** (Poster)
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

This research examines the multiple discourses surrounding the economic and environmental development of a small to medium sized, liberal arts college in the Midwest. Using an exploratory case study approach, I sought to understand how an academic institution manages its sustainability goals with other multiple, potentially conflicting goals. In other words, in the context of budget cuts, decreasing enrollment, and a variety of other historical and contemporary factors, how do key decision makers both define sustainability and bring it into practice? Conversely, how do other actors—students, faculty and staff—understand, contest, resist and/or add to the multiple and potentially confusing discourses coming from the institution? To address these questions, I engaged in a multi-method research project that included qualitative interviews with actors at different levels within the institutional hierarchy and community as a whole. Interviews were supplemented with a content analysis of historical and contemporary documents tracing how the university’s plans for sustainability and development have evolved, paying particular attention to the rhetoric used to define the issue. Themes that have emerged from this analysis include an anxiety over urbanization that had preaced the adoption of sustainability, and the community leaders’ tying together of sustainable issues with issues of preserving the town boundary and rustic way of life. I conclude that aspects of
mainstream, nativist environmentalism and small town values have shaped the adoption of this university’s particular brand of sustainability, influencing a kind of utopian outlook in favor of preserving rustic life over urban life.

**Ritsch, Abigail**

**The Effects of Fat Talk and Peer Influence on Body Image** (Poster)
Research Collaborator(s): Alexis Sliva  
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

This project will add to established research about how fat talk or positive talk in conversations influences dissatisfaction in body image (Salk & Engeln-Maddox, 2011). Participants will be asked to fill out a questionnaire that includes measures on body image and body dissatisfaction. The participants will also be asked to rate their perceptions of the women engaging in the body talk. The goal of our study is to examine the effects of fat talk in dialogue on college-aged women. We believe that the participants will have different perceptions of the women engaging in each type of body talk (fat vs. positive talk) there will be different acceptance levels of the participants (Tompkins, Martz, Rocheleau, & Bazzini, 2009). We hypothesize that fat talk will impact peers in a negative way and that positive talk will affect body image in a positive way (Dohnt & Tiggermann, 2006).

**Ritsch, Abigail**

**The Effects of a Community Parent Education Class on Parents of Infants** (Poster)  
Research Collaborator(s): Alexis Sliva, Shea Lammers  
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

The purpose of this study was to examine the effects of a free parent education class offered by a resource center across three different counties in the Wisconsin area. Parents were asked to complete a pre and post survey which primarily assessed risk (e.g., parenting stress) and protective (e.g., social support) factors associated with child abuse and neglect. We hypothesized that program involvement would lead to an increase protective factors and decrease risk factors. Our findings partially supported our hypothesis in that there was a reduction in the risk factor we assessed, as well as an increase in one of protective factors assessed.

**Rolseth, Mark**

**Lights, Camera, Action! - High School Film and Acting Workshops**  
(PowerPoint)  
Faculty Mentor(s): Erik Johnson, Stage and Screen Arts

Summer Scholars Grant recipient Mark Rolseth, along with faculty adviser Erik Johnson, conducted a series of workshops at three high schools in Pierce
County, giving students a hands-on learning experience with creating a film. The various roles of production and acting were discussed and then executed by students, who filmed and acted in their own version of a scene from a popular film. The footage was then edited into a sequence and posted online to be shared with their peers. The outreach was an effort to support the University's goal of recruitment and retention in a creative way, promoting the new Stage and Screen Arts program at UWRF.

Ross, Alyssa

**College Students Attitudes toward Feminism** (Poster)
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

Previous research has looked at social support for the feminist movement and has found that it has been on a rapid decline even though overall support for gender equality has risen significantly (Anderson 2009). Multiple studies have addressed this issue and have found that the majority of people have negative attitudes surrounding feminists and the feminist movement. This study aims to expand on the social phenomenon in which the majority of men and women agree with feminist values but do not assign themselves to the label of feminist. This is partially due to negative stereotypes associated with the feminist movement and we believe that an intervention of feminist ideologies will increase positive attitudes towards the feminist movement (Thomsen, Basu, & Reinitz, 1995). Attitudes towards the feminist movement will be assessed before and after an intervention with a minimum of 4 days in between responses. We expect to find that women will be more likely to view feminism positively before the intervention (Rossell & Hartman, 2001). We also expect that men will show the greatest increase in attitudes toward feminism after an intervention (Houvouras & Carter, 2008).

Sawdy, Michael

**The Effects of Embedded Versus Peripheral Corporate Social Responsibility on Organizational Attraction** (Poster)
Research Collaborator(s): Yeng Som
Faculty Mentor(s): Dr. Travis Tubre, Psychology and Dr. Melanie Ayres, Psychology

Our research aims to add to the growing body of corporate social responsibility (CSR) research. We will test for differences in organizational attraction between one job ad utilizing embedded compared to another using peripheral CSR. Tests for the personality variables of openness to experience and agreeableness will be included in an effort to add to the growing research into person-organization fit. We expect that participants who view the embedded job ad brochure will report higher organizational attraction.
Sesing, Emilee

*Self-Esteem Relates to College Students’ Self-Representation on Facebook* (Poster)
Research Collaborator(s): Elizabeth Bruns
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

With social media becoming an everyday activity for most, research in this domain is critical to understanding other people through this media. Our study examines the relationship between self-esteem and self-representation on Facebook among college students. We expect to see individuals with low self-esteem to have higher self-representation concerns than those with high self-esteem. In relation to gender, we expect that females will have higher concerns with self-representation on Facebook than males. We do not expect to see an interaction between self-esteem and gender. Participants were recruited from the Psychology Department of University of Wisconsin-River Falls and asked to complete an online survey regarding these variables.

Silva da Silva, Danilo

*Hidden Trails along the Kinnickinnic* (Poster)
Research Collaborator(s): David Bergs
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

There are several miles of trails along the Kinnickinnic River near Glen Park that are unmapped. Using a GPS and field observations, point and line data were collected for these well-hidden single-track trails. Using the GPS data we produced a map of current trails and an elevation profile of important routes.

Sliva, Alexis

*The Effects of Fat Talk and Peer Influence on Body Image* (Poster)
Research Collaborator(s): Abigail Ritsch
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

This project will add to established research about how fat talk or positive talk in conversations influences dissatisfaction in body image (Salk & Engeln-Maddox, 2011). Participants will be asked to fill out a questionnaire that includes measures on body image and body dissatisfaction. The participants will also be asked to rate their perceptions of the women engaging in the body talk. The goal of our study is to examine the effects of fat talk in dialogue on college-aged women. We believe that the participants will have different perceptions of the women engaging in each type of body talk (fat vs. positive talk) there will be different acceptance levels of the participants (Tompkins, Martz, Rocheleau, & Bazzini, 2009). We hypothesize that fat talk will impact peers in a negative way
and that positive talk will affect body image in a positive way (Dohnt & Tiggermann, 2006).

**Sliva, Alexis**

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**Som, Yeng**

*The Effects of Embedded Versus Peripheral Corporate Social Responsibility on Organizational Attraction* (Poster)

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**Stempel, Kristopher**

*Social Disconnection* (Artwork)  
Faculty Mentor(s): Peter Mak, Art  

I created a series of oil paintings that explore social disconnection and the internal and external conflict between people in modern society. The six oil paintings have compositions that are stitched together from memories, observations and my imagination. Additional reference material came from personal photographs from my childhood and from those I captured as an adult.
The white-eyed people represent empty headedness, people who go from point A to point B without thinking of others around them or the consequences of their actions. Their headlight-like eyes are used to guide them, but they are not used for seeing. The faces are distorted in a way that dehumanizes the figure and prevents the viewer from being able to form any sort of emotional bond; the purpose is to create a feeling of discomfort but not fear.

The paintings strive to reach out to its audience by having the central figure look out to the viewer in a plea for a connection. The scenarios and facial expressions of each central figure are intended to have a certain level of ambiguity in order for the viewer to relate to the scene from their own experience. The first five paintings escalate in content and end calmly with the sixth painting. While it’s clear that the paintings get more intense in the sequence, the exact meanings and stories are meant to be open-ended.

**Stencil, Cody**

**White Tail Ridge Mountain Bike Map** (Poster)
Research Collaborator(s): Tucker Hagen, Kyle Glowa, Alex Hamus
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

Whitetail Ridge Mountain Bike Trail, near River Falls, WI, is a popular destination for novice and advanced mountain bikers alike. The area currently has no up-to-date map with a detailed depiction of the separate trail sections. Trail data was collected by GPS fieldwork, digital camera and GoPro video over the course of two weeks. The final map aims to allow riders to better choose their path based on individual skill level.

**Stokke, Emily**

**Analysis of Immunoglobulin Genes in Swine** (Poster)
Faculty Mentor(s): Dr. Karen Klyczek, Biology

In 2009, swine flu became a pandemic. Although this is the most well known virus that has been harbored in swine, these animals can transmit several viruses to humans. Through our research analyzing the immunoglobulin genes in swine, we will better understand the immune system of swine and their immune responses to viruses such as influenza, as well as how these compare to the human immune system. Our initial focus is examining the extent of Immunoglobulin G (IgG) subclass gene polymorphism and splice site variation. We have isolated RNA and DNA from the white blood cells of pigs at the University of Wisconsin-River Falls lab farm, and copied the RNA into cDNA. PCR has been used to amplify the various constant region domains as well as the V-D-J splicing regions. The PCR products have been cloned and sequencing data results are being examined. By comparing the rearranged cDNA to germline DNA, we will be able to identify splicing patterns. Genomic DNA sequences will
be compared to determine allotypic differences among these animals as well as with previously studied swine.

**Strobeen, Stephanie**

*Generation and comparative analysis of placental choriocarcinoma tumor spheroids using hanging drop culture methods.* (Poster)

Faculty Mentor(s): Dr. Timothy Lyden, Biology

During normal early human development the first type of cell to undergo specialization and the process of differentiation is the outer covering epithelial cells of the blastocyst. These cells, called the trophectoderm, eventually develop into the trophoblast of the normal placenta, both of which display virtually all of the characteristics of invasive cancers later in life. In fact, this relationship is so close that scientists have previously suggested that all cancers were actually derived from the trophoblast of the placenta. Today we understand that, in fact, these characteristics are reflective of the early developmental nature of cancer cells and likely is a direct reflection of the stem cell nature of cancers and trophoblast alike. In order to address this crossover between early developmental processes of attachment, implantation, invasion and establishment of the “foreign” placental tissues with the cancer-related processes of tumor cell shedding, nodule formation, metastasis, invasion and new tumor progression, we have begun a series of studies to define these characteristic processes in several trophoblastic tumor cell lines. Using 3D culture techniques, we have produced a staged series of artificial tumor tissues from the choriocarcinoma cells lines; BeWo, Jeg-3 and JAR. Each of these cell lines has a distinct and characteristic set of properties with varying degrees of malignancy. Interestingly, these three tumor cell lines also display very different responses to the hanging drop culture environment designed to generate spheroid cultures. The major difference observed between these lines and contrasting with previous work done with these methods using breast cancer cell lines, was that BeWo and JEG-3 did actually form clearly rounded spheroids by 72-96 hours in culture and then retained this shape as they grew larger out to 120 hours. In contrast, JAR cells form very small spheroids early in culture which immediately coalesced into branching tubes or columns of cells. These then expanded out to form relatively flat "snowflake-like" structures by 72 hours. These flat relatively geometric structures became very large through 120 hours but never formed truly rounded structures. Structural labeling studies are ongoing and western blot analysis will be performed to examine the pattern of cell adhesion molecules expressed by each type of 3D structure and each cell line as well as markers of both epithelial/mesenchymal transition (EMT) and stem cell status. It is expected that the structural differences observed in these early studies will be reflected in differential target adhesion and invasive behaviors as the project continues. Eventually, these studies will also use 3D artificial tissue constructs of stromal and endometrial origin as target tissues for tumor spheroids, nodules and “snowflakes” from each of these trophoblast cell
lines. It is our working hypothesis that these trophoblastic choriocarcinoma spheroids will be good working models of both cancer metastasis as well as early implantation events at the start of gestation and therefore will provide a means to examine these two related processes in vitro.

**Stueven, Noah**

*A11, a Potential Drug for Melanoma Cancer* (Poster)
Faculty Mentor(s): Dr. Cheng-Chen Huang, Biology

Our lab is working on identifying various skin lightening drugs to compare with current drugs already on the market. One phenolic compound that was identified and named A11 could reduce the black pigment in developing zebrafish embryos. A11 was more potent than other common current human skin-lightening products, including arbutin, niacinamide, kojic acid, gallic acid, and tretinoin, and was found to be non-toxic. Using a transgenic zebrafish line that produced a melanoma-like phenotype in fresh embryos, we found that A11 seemed to suppress the melanoma formation when the embryos were constantly treated to the compound. To continue testing of A11, my project was to use a B16-F10 mouse melanoma cell line. Because this is a mammalian cell line, it can easily be studied, and the effects of chemicals can be easily observed. The cell line was used by treating the melanoma cells with A11 and other skin lightening drugs, and then counting the cells and measuring the melanin in the cells. The results showed that A11 killed the cells and lowered the melanin at higher concentrations, while not being very effective at lower concentrations. A11 also seems to reduce the expression of a gene called dct which is known to be expressed in melanocyte precursor cells but not in mature melanocytes, suggesting A11 might suppress melanocyte formation and/or proliferation and survival. With more testing, A11 could eventually become a viable drug for skin cancer, or be used in combination with other cancer drugs to help cure melanoma.

**Thomas, Richard**

*An Investigation of the Perceived Importance and Inclusion of Music Standards within Minnesota and Wisconsin Classrooms* (Poster)
Research Collaborator(s): Rebecca Huth, Ryan Nattrass, Dillon Chieve
Faculty Mentor(s): Dr. Paul Budde, Music

The purpose (objective) of this study “is to gather information from current music educators in Minnesota and Wisconsin regarding their attitudes about and implementation of state and national music standards within their classrooms.”

Our research will be conducted via an online survey sent to approximately 5500 music educators in Wisconsin and Minnesota (roughly 2700 in Minnesota and 2800 in Wisconsin, per the estimates given by the Minnesota Music Educators
Association and Wisconsin Music Educators Association). The survey will be distributed this school year, with a target of mid-January 2016.

With the information gathered from the survey, the goal of this project is to discover whether there is a correlation between a music educator’s (a) gender, (b) age, (c) school setting (rural-urban-suburban), (d) classes taught (band-choir-orchestra-classroom music-other) (e) grade level taught (K-12), (f) teaching experience (years), or (g) highest degree earned regarding the value that s/he associates with the inclusion of specific music standards when constructing daily lesson plans, regarding his/her knowledge about State (Minnesota and Wisconsin) and National (1994 and 2014) music standards, and regarding his/her inclusion of specific music standards within daily lesson plans?

**Tindell, Katherine**

*Public Perception of Labor Unions (Poster)*  
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

Since the 1980’s, unions have declined in number and strength in the United States at the same time that the gap between the richest and poorest has continued to increase. In spite of this, public support for unions is ambiguous at best. Is Wisconsin, with its strong historical support for labor movements, a microcosm of these larger trends? This study seeks to determine the public's perception of labor unions through a survey.

**Toth, Michaela**

Faculty Mentor(s): Dan Paulus, Art

A large-scale, mixed-media artwork that pays homage to the history found at the University of Wisconsin-River Falls (UWRF). This artwork is made with the viewer in mind. The map of campus is simple and functional; the assisting material is rich, layered, and inviting. The artwork places emphasis on the significant accomplishments, activities, and offerings at UWRF, as well as the dedication and involvement of the many individuals who have contributed to the past, present, and future Falcon legacy.

**Townsend, Katelyn**

*Juvenile Rehabilitation (Poster)*  
Faculty Mentor(s): Dr. Paige Miller, Sociology, Criminology and Anthropology

There are many factors that influence the rate of success or failure in youth’s rehabilitation from drug and alcohol use. I would like to explore these factors by speaking with professionals who work with at risk youth to uncover what they
see as being the most important factors leading to young people ceasing drug and alcohol use and those factors most likely to lead to relapse.

Tumbarello, Anthony

*The Mapping of Solar Alignments in Neolithic Burial Cairns of the Orkney Islands* (Short Film)

Faculty Mentor(s): Dr. Charles Rader, Geography and Mapping Sciences

During the Neolithic, the inhabitants of the Orkney Islands buried their dead in communal burial tombs known as cairns. There are dozens of these structures distributed across the archipelago. These cairns vary categorically in shape, internal structure, date of construction, and the assortment of grave goods left with the remains. They all share the feature of a low and narrow entrance passageway, which opens into a larger central chamber. If facing in the correct direction, the rising or setting sun shines down the entrance passageway and illuminates the back wall of the main chamber. This study analyzed the azimuth of the entrance passageways to determine which types of alignments were most prevalent. Solstices, equinoxes, and Celtic pagan cross-quarter days were used as the test points of alignment. The azimuth of the rising and setting sun was calculated for every day of the test year, 3200 BCE. These solar measurements were also used in conjunction with the calculated azimuthal range of the tombs to determine the number of days which each cairn would exhibit an alignment. The data on the cairns was collected through a combination of field research and previously published studies. This data was then analyzed statistically compared to a random dataset, as well as spatially through viewshed analysis in ArcMap. The analysis was able to determine a correlation between the existence of solar alignments and specific typological features, as well as terrestrial alignments with a different set of features. If intentional, these alignments help to shed light on the function of these cairns, cultural differences across the archipelago, and a shift in ritual practices during the period of cairn construction.

Valadares, Diego

*The Balloon Project* (Poster and balloon display)

Research Collaborator(s): Jason Blatz, Sammi Grzybowski

Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

Aerial photography has been used in city planning, wildlife protection, and agricultural research, among others. This project focuses on developing techniques in order to obtain quality imagery using a digital camera and helium balloon. The images were taken at Hoffman Park in River Falls, Wisconsin, where we collected data on three separate occasions. Following data collection, the images were processed and used in a Geographic Information System (GIS) as reference material for mapping.
Valadares, Diego

*Proposed Route for Public Transportation in River Falls* (PowerPoint)

Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

This study aims solve a public transportation problem identified in River Falls, WI. Using the software Arcmap 10.2, with the Network Analysis extension, I proposed two routes for public transportation between River Falls and your neighbors. This is an analysis based on the distance aspect, that generates a service area with contours for 5, 10, 20 and 30 miles of distance from River Falls. As a result, I produced two maps for each route helping to develop a connection with Minneapolis. Furthermore, this study is a practical way to develop and understand how to apply geographic information in a specific area of interest for public visualization and government management.

VanderBloomer, Stephanie

*How does the integration of the developmentally disabled impact an organization and society?* (Poster)

Faculty Mentor(s): Grace Coggio, Journalism

This paper is to understand what society can do to encourage companies to employ persons with developmental disabilities as well as the importance of introducing them into everyday life. I not only want to know what procedures an organization goes through, but also the atmosphere of companies who are dedicated to this minority population of developmentally disabled. I explore the importance of integrating this population into society as well as how it can be done. I wanted to find out what kind of organizations there are that support the developmentally disabled and their role in job placement and further integration. I will explore the factors taken into consideration when a company is making the decision to not hire a person with a disability. I conducted interviews with Human Resources representatives to gather my data.

Vaught, Hannah

*The Surprising Cardiac Toxicity of Arbutin, a Common Skin Lightening Chemical* (Poster)

Faculty Mentor(s): Dr. Cheng-Chen Huang, Biology

Arbutin is a natural and popular skin-lightening agent found within many cosmetic products designed to lighten and even skin tone. However, the toxicity of arbutin has not been closely studied. Earlier research done by our lab has shown unusual cardiac toxicity of arbutin in developing zebrafish embryos. My project was designed to better understand the arbutin toxicity. We first found that arbutin consistently caused specific cardiac defects in a dosage dependent manner. In the next experiment, young zebrafish embryos were treated with
arbutin before cardiac development occurred in order to identify the effects of arbutin on the developing heart. Older embryos were also treated with arbutin to study the impact of arbutin on the developed heart. The results showed that while arbutin was toxic to all the embryos tested, the older embryos with already developed cardiac tissues exhibited poor circulation, reduced heart size, and death earlier than younger embryos. Paraffin-sectioning of the hearts showed that arbutin treated embryos displayed collapsed cardiac chambers, and no lumen was visible within the two chambers. Furthermore, labeling and analysis of cell death within arbutin treated embryos revealed an overall increase of apoptosis in cardiac tissue. Throughout this project, arbutin has displayed unreported cardiac toxicity, showing a need for alternate skin lightening compounds.

**Vodra, Kelly**

*Perceived Stress and Facebook Usage and Frequency* (Poster)
Research Collaborator(s): Danielle Bloch
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

This study attempts to collect information about how college students perceive stress and how their stress levels are affected by Facebook usage and social interaction. Stress levels will be measured by looking at common hassles experienced by college students during semesters. We will also look at the amount of social interaction activity.

**Wallace, Michael**

*Using GPS to create high resolution terrain data* (Poster)
Research Collaborator(s): Tyler Galde, Trent Gundrum
Faculty Mentor(s): Dr. Mathew Dooley, Geography and Mapping Sciences

High resolution terrain data used for 3D mapping is scarce, and River Falls is no exception. In this project we made a more defined, higher resolution Digital Elevation Model (DEM) to see if it is possible to generate the information using a hand held GPS receiver. We selected a location, in River falls near Lake Louise, where we collected elevation data every 5 meters with Garmin GPS receivers. The final DEM shows a high resolution elevation image. Overall, our process produced successful results, but more testing is necessary to further hone accuracy.

**Warmus, Grant**

*Perceived and Actual Vulnerability of Social Network Profile Content to Employer Review* (Poster)
Faculty Mentor(s): Dr. Travis Tubre, Psychology
The use of social networking sites like Facebook and Twitter is increasing substantially among the general public, and especially among college students. At the same time, employers are substantially increasing their use of social network screening for applicants to their companies (Roberts, 2010). For instance, recent surveys indicate that up to 50% of employers are now searching social networking sites for information about applicants (Brown and Vaughn, 2011). Although many have questioned whether this employer behavior is invasive or legally problematic (Zeidner, 2007), it is clear that these practices are increasingly common. As a result, job applicants need to be more aware of how information presented in these contexts makes them vulnerable in a variety of ways, including potential employment rejections that occur because of content on their social networking profiles (Paradise and Sullivan, 2012). In our study, we will survey UWRF students Facebook users about their perceptions of vulnerability to negative judgments about them based on information available in their Facebook profiles. In lab sessions, we will then have them log into Facebook and run an application called Reppler that uses an algorithm to scan their profile for objectionable content. Our goals are to statistically compare students’ self-rated vulnerability to Reppler’s algorithmically determined vulnerability and to see whether either of the scores is related to current job seeking behavior.

Wiechman, Claire

*Exploratory Survey: Child Digital Media Exposure and Parent Motivations* (Poster)
Research Collaborator(s): Shea Lammers
Faculty Mentor(s): Dr. Melanie Ayres, Psychology

Despite recommendations from the American Academy of Pediatrics (AAP) to limit digital media exposure, many children under 2 years are regularly exposed to various types of digital media, such as television, tablets, and mobile devices (Rideout & Hamel, 2006). This project expands on past research examining correlations between parent motivation and child television viewing (Cingel & Krcmar, 2013), as well as research that examines parent demographic and attitude predictors of amount of child media use (Lauricella, Wartella, & Rideout, 2015). This study explores parent motivations for child media exposure, as well as parent awareness of AAP media recommendations. The study assesses parent demographics and their relationship to child media use. The researchers also explored whether parents have conflicting feelings about their child’s media use and their awareness of AAP media recommendations.

Wolf, Steven

*Trumpeter Swan Preserve Boundary Marking Proposal* (Poster)
Faculty Mentor(s): Dr. Charles Rader, Geography and Mapping Sciences
The Trumpeter Swan Preserve is a 48 acres preserve at the head waters of the Kinnickinnic River that is owned and managed by the Kinnickinnic River Land Trust. In order to retain preserve status, the boundaries of the property must be properly marked with sign posts. This project proposes multiple locations for boundary signs to be placed around the preserve. GPS units, digital photography, and field observations were used to determine the most effective signage placement. The map produced shows nine proposed sign points on the Southern and Eastern boundary of the Trumpeter Swan Preserve.

Zill, Robert

*Characterizing the Emission from Light Emitting Diodes in IceCube cDOMs* (Poster)

Research Collaborator(s): Samantha Pedek
Faculty Mentor(s): Dr. James Madsen, Physics; Dr. Surujhdeo Seunarine, Physics; Dr. Lowell McCann, Physics

IceCube is a one cubic kilometer neutrino telescope located deep within the Antarctic ice. It is a new type of telescope designed to study the Universe using neutrinos, an electrically neutral, nearly massless particle that is emitted from energetic objects like supernovas and active galactic nuclei. Neutrinos are detected indirectly by the light emitted when they interact in the volume of ice observed by IceCube. The light emitted can be detected by the thousands of light sensors called DOMs (Digital Optical Modules) that make up IceCube. Most DOMs are equipped with twelve identical Light Emitting Diodes (LEDs) used for calibrating the detector and the properties of the ice within the detector’s sensitive volume. A few DOMs, cDOMs (Color Digital Optical Modules), are fitted with LEDs of four different wavelengths. In this study, we determined different properties of the LEDs in a cDOM including the peak wavelength, spectral width, absolute intensity, and angular emission profile of each LED. These results will be used to better understand the data taken when the cDOM LEDs are flashed and will improve our understanding of the wavelength dependence of detector response and ice properties.
College of Business and Economics

Ahlfs, Matthew

The Female-Male Earnings Gap (Poster)
Research Collaborator(s): Lexis Pingel, Michelle Chen, Lydia Reardon
Faculty Mentor(s): Dr. John Walker, Economics

This study is about the 21% earnings gap between males and females in the United States. This earnings gap is important because by limiting women, we are limiting the innovation process that causes our economy to grow. Furthermore, women are penalized for having children, even though children are vital to the future of our country. We created a model based on our literature review, created our hypotheses, and pulled data from IPUMS. We ran three different regression tests. The first included data pooled from males and females, and the other two were separated by gender. Several dummy variables were also included. Our results suggest there is discrimination in the labor market against female workers, after taking into account the explanatory variables of years of education, usual hours worked per week, potential labor market experience, and number of children under five. The literature suggests female role modeling in underrepresented career sectors, increased paid maternal and paternal leave in the workplace, and more equal division of household labor and child care, will help bridge the female-male earnings gap.

Anderson, Ethan

The Phillips Curve (Poster)
Research Collaborator(s): Aaron Reams, Michelle Brunsgaard, Bethany Sommerfeldt
Faculty Mentor(s): Dr. John Walker, Economics

Can the Federal Reserve effectively exploit an inverse relationship between inflation and unemployment to satisfy its dual mandate of price stability overall and maximum employment in order to benefit society’s welfare?

Augustinovich, Sharon

Cost of turnover (Poster)
Research Collaborator(s): Brea Williamson
Faculty Mentor(s): Dr. Claire McCarty, Management and Marketing

We are presenting the cost of turnover for two businesses. One is a larger scale business with the focus of the cost of turnover for a full time employee and the other is for a smaller company with the focus of a part time employee. The cost of replacing one employee may not be as small of a number as one would think.
Bear, Nicole

*McDonald's Financial Ratios* (Poster)
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

Project demonstrates how McDonald's financial ratios compare to industry averages.

Brunsgaard, Michelle

*The Phillips Curve* (Poster)
Research Collaborator(s): Ethan Anderson, Aaron Reams, Bethany Sommerfeldt
Faculty Mentor(s): Dr. John Walker, Economics

Can the Federal Reserve effectively exploit an inverse relationship between inflation and unemployment to satisfy its dual mandate of price stability overall and maximum employment in order to benefit society’s welfare?

Carufel, Donald

*Microsoft's Financial statements and performance over the last few years* (PowerPoint)
Research Collaborator(s): Connor Kindom, Blake Durbahn
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

Microsoft's Financial statements and performance over the last few years along with some of there new R&D projects displayed.

Chen, Michelle

*The Female-Male Earnings Gap* (Poster)
Research Collaborator(s): Lexis Pingel, Matthew Ahlfs, Lydia Reardon
Faculty Mentor(s): Dr. John Walker, Economics

This study is about the 21% earnings gap between males and females in the United States. This earnings gap is important because by limiting women, we are limiting the innovation process that causes our economy to grow. Furthermore, women are penalized for having children, even though children are vital to the future of our country. We created a model based on our literature review, created our hypotheses, and pulled data from IPUMS. We ran three different regression tests. The first included data pooled from males and females, and the other two were separated by gender. Several dummy variables were also included. Our results suggest there is discrimination in the labor market against female workers, after taking into account the explanatory variables of years of education, usual hours worked per week, potential labor market experience, and number of children under five. The literature suggests female role modeling in underrepresented career sectors, increased paid maternal and paternal leave...
in the workplace, and more equal division of household labor and child care, will help bridge the female-male earnings gap.

**Connors Roth, Martha**

*FIZZ or Fiber Fun* (Poster and mohair items)
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

Preliminary audit plan for the audit of the financial statements of National Beverage Corporation (FIZZ) plus unrelated fiber and projects from Angora goats just for fun.

**Dietrich, Michael**

*Preliminary Audit Plan* (Poster)
Research Collaborator(s): Casey Maus, Paige Johnson
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

The project is an audit plan for Walgreen Company and CVS Health Corporation. It includes audit objectives, a preliminary business and industry condition analysis, client objectives and strategies, significant risks, significant accounting and auditing matters, preliminary analytical procedures, and planning materiality for the two companies.

**Dubanoski, Edward**

*Money Demand Stability* (Poster)
Research Collaborator(s): Josie Gilbertson, Xiang Zhang
Faculty Mentor(s): Dr. John Walker, Economics

Our objective is to determine if there is stability in the demand for money. We gathered knowledge on early theories of money demand and on latter literature reviews to determine the best measures of money demand, income, and interest rates and the time periods to use. We choose M1 and M2M as our measures of money demand. M1 includes physical money, demand deposits, and checking accounts and M2M includes interest bearing accounts that are nearly as liquid as the accounts in M1. For interest rates we used a 3 month treasury bill for M1 and the M2M own rate for M2M. Lastly, we used GDP for our income. All of variables were measured in logarithm real terms and deflated with GDP deflator. Regression analysis is used to test our demand model. The data time period is 1940-2014.

**Durbahn, Blake**

*Microsoft’s Financial statements and performance over the last few years* (PowerPoint)
Research Collaborator(s): Connor Kindom, Donald Carufel
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance
Microsoft's Financial statements and performance over the last few years along with some of there new R&D projects displayed.

**Gilbertson, Josie**

*Money Demand Stability* (Poster)
Research Collaborator(s): Edward Dubanoski, Xiang Zhang  
Faculty Mentor(s): Dr. John Walker, Economics

Our objective is to determine if there is stability in the demand for money. We gathered knowledge on early theories of money demand and on latter literature reviews to determine the best measures of money demand, income, and interest rates and the time periods to use. We choose M1 and MZM as our measures of money demand. M1 includes physical money, demand deposits, and checking accounts and MZM includes interest bearing accounts that are nearly as liquid as the accounts in M1. For interest rates we used a 3 month treasury bill for M1 and the MZM own rate for MZM. Lastly, we used GDP for our income. All of variables were measured in logarithm real terms and deflated with GDP deflator. Regression analysis is used to test our demand model. The data time period is 1940-2014.

**Johnson, Paige**

*Preliminary Audit Plan* (Poster)
Research Collaborator(s): Casey Maus, Michael Dietrich  
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

The project is an audit plan for Walgreen Company and CVS Health Corporation. It includes audit objectives, a preliminary business and industry condition analysis, client objectives and strategies, significant risks, significant accounting and auditing matters, preliminary analytical procedures, and planning materiality for the two companies.

**Keuntjes, Heidi**

*Starbucks Audit Report* (Poster)
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

I will present my audit for the year ending 2014 of Starbucks. This will include financial ratios and industry conditions.

**Kindom, Connor**

*Microsoft's Financial statements and performance over the last few years* (PowerPoint)  
Research Collaborator(s): Donald Carufel, Blake Durbahn  
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance
Microsoft's Financial statements and performance over the last few years along with some of there new R&D projects displayed.

**Maus, Casey**

**Preliminary Audit Plan** (Poster)
Research Collaborator(s): Paige Johnson, Michael Dietrich
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

The project is an audit plan for Walgreen Company and CVS Health Corporation. It includes audit objectives, a preliminary business and industry condition analysis, client objectives and strategies, significant risks, significant accounting and auditing matters, preliminary analytical procedures, and planning materiality for the two companies.

**Pankow, Bethany**

**Preliminary Audit Plan for Unifi, Inc.** (Poster)
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

My project is the construction of a preliminary audit plan for Unifi Inc. It contains audit objectives, challenges one might face when auditing Unifi Inc., the company I chose, and the business risks faced by the company.

I will present all my findings about the finances of this company and demonstrate how that will affect the auditors.

**Pingel, Lexis**

**The Female-Male Earnings Gap** (Poster)
Research Collaborator(s): Michelle Chen, Matthew Ahlfs, Lydia Reardon
Faculty Mentor(s): Dr. John Walker, Economics

This study is about the 21% earnings gap between males and females in the United States. This earnings gap is important because by limiting women, we are limiting the innovation process that causes our economy to grow. Furthermore, women are penalized for having children, even though children are vital to the future of our country. We created a model based on our literature review, created our hypotheses, and pulled data from IPUMS. We ran three different regression tests. The first included data pooled from males and females, and the other two were separated by gender. Several dummy variables were also included. Our results suggest there is discrimination in the labor market against female workers, after taking into account the explanatory variables of years of education, usual hours worked per week, potential labor market experience, and number of children under five. The literature suggests female role modeling in underrepresented career sectors, increased paid maternal and paternal leave in the workplace, and more equal division of household labor and child care, will help bridge the female-male earnings gap.
Reams, Aaron

*The Phillips Curve* (Poster)
Research Collaborator(s): Ethan Anderson, Michelle Brunsgaard, Bethany Sommerfeldt
Faculty Mentor(s): Dr. John Walker, Economics

Can the Federal Reserve effectively exploit an inverse relationship between inflation and unemployment to satisfy its dual mandate of price stability overall and maximum employment in order to benefit society’s welfare?

Reardon, Lydia

*The Female-Male Earnings Gap* (Poster)
Research Collaborator(s): Lexis Pingel, Michelle Chen, Matthew Ahlf
Faculty Mentor(s): Dr. John Walker, Economics

This study is about the 21% earnings gap between males and females in the United States. This earnings gap is important because by limiting women, we are limiting the innovation process that causes our economy to grow. Furthermore, women are penalized for having children, even though children are vital to the future of our country. We created a model based on our literature review, created our hypotheses, and pulled data from IPUMS. We ran three different regression tests. The first included data pooled from males and females, and the other two were separated by gender. Several dummy variables were also included. Our results suggest there is discrimination in the labor market against female workers, after taking into account the explanatory variables of years of education, usual hours worked per week, potential labor market experience, and number of children under five. The literature suggests female role modeling in underrepresented career sectors, increased paid maternal and paternal leave in the workplace, and more equal division of household labor and child care, will help bridge the female-male earnings gap.

Schmidt, Dylan

*Preliminary Audit Plan for PepsiCo* (Poster)
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

This project will contain the preliminary audit plan and procedures for the financial statements of PepsiCo during the years 2013 and 2014.

Sommerfeldt, Bethany

*The Phillips Curve* (Poster)
Research Collaborator(s): Ethan Anderson, Aaron Reams, Michelle Brunsgaard
Faculty Mentor(s): Dr. John Walker, Economics
Can the Federal Reserve effectively exploit an inverse relationship between inflation and unemployment to satisfy its dual mandate of price stability overall and maximum employment in order to benefit society’s welfare?

Sunar, Dal

*Analysis of financial documents* (Poster)
Faculty Mentor(s): Dr. Dawn Hukai, Accounting and Finance

Financial analysis of a company.

Williamson, Brea

*Cost of turnover* (Poster)
Research Collaborator(s): Sharon Augustinovich
Faculty Mentor(s): Dr. Claire McCarty, Management and Marketing

We are presenting the cost of turnover for two businesses. One is a larger scale business with the focus of the cost of turnover for a full time employee and the other is for a smaller company with the focus of a part time employee. The cost of replacing one employee may not be as small of a number as one would think.

Zhang, Xiang

*Money Demand Stability* (Poster)
Research Collaborator(s): Josie Gilbertson, Edward Dubanoski
Faculty Mentor(s): Dr. John Walker, Economics

Our objective is to determine if there is stability in the demand for money. We gathered knowledge on early theories of money demand and on latter literature reviews to determine the best measures of money demand, income, and interest rates and the time periods to use. We choose M1 and MZM as our measures of money demand. M1 includes physical money, demand deposits, and checking accounts and MZM includes interest bearing accounts that are nearly as liquid as the accounts in M1. For interest rates we used a 3 month treasury bill for M1 and the MZM own rate for MZM. Lastly, we used GDP for our income. All of variables were measured in logarithm real terms and deflated with GDP deflator. Regression analysis is used to test our demand model. The data time period is 1940-2014.
College of Education and Professional Studies

Foy, Madeline

**Resiliency in Siblings of Children with Developmental Disabilities**
(Poster)
Faculty Mentor(s): Dr. Sharyl Samargia, Communication Sciences and Disorders

Past research has shown, parents of children with developmental disabilities are more resilient and exhibit greater patience, tolerance, and sensitivity compared to parents of typically developing children. Considering the evidence regarding parents, one could speculate siblings of children with developmental disabilities may also have greater resiliency. However, no known literature exists regarding the resiliency of siblings of children with developmental disabilities. Purpose: The purpose of this study was to compare the resiliency between siblings of children with developmental disabilities to siblings of typically developing children. Methods: Recruitment occurred through the Driven to Discover Research Program at the University of Minnesota. Individuals attending the MN State Fair were recruited and screened for eligibility. Data from pilot study was incorporated for overall analysis. 78 children, ages 9-17 (mean age =12 years 8 months) were placed into two groups 1) siblings of typically developing children (n=42, mean age = 12yrs 4moth) and 2) siblings of children with developmental disabilities (n=36, mean age = 13years 1 month). Each participant completed the Resiliency Scales for Children and Adolescents: A Profile of Personal Strengths. This measure has three subtests: sense of mastery, sense of relatedness and sense of emotional reactivity. Results: An analysis of variance indicated no significant differences between the groups across all subtests (p>0.05). Statistical significance was nearly found in the MAS subtest of trust; however, this finding did not correlate with disability type nor severity. This may have been due to study limitations. Conclusion: This study provided valuable information to guide future research in understanding resiliency in siblings and will lay the foundation for future supportive programming.

Hastings, Katlin

**The Impact of Family Resource Center Play & Learn Groups on School Readiness** (Poster)
Research Collaborator(s): Madeleine Pemberton
Faculty Mentor(s): Dr. Molly Gerrish, Teacher Education
Research focused on determining the impact of Family Resource Center Play and Learn groups on school readiness. The purpose of the study was to evaluate the effectiveness of Play and Learn activities and to determine if and how the program can be improved. Areas identified for study included: parent support; health, safety, and nutrition; social and emotional development and relationships; language and communication; approaches to learning; motor development and behavior management. Data was collected through parent and teacher interviews which were analyzed for recurring themes. Triangulation was provided by researcher observations and parent surveys. Evidence reflected that children were benefiting in every learning domain with socialization and language development noted most often by the parents. Data from parents indicated that the support offered in the Play and Learn sessions served to increase parental confidence levels, reduced stress and enhanced the parent/child relationship. These sessions also played a critical role in parental understanding of child development. Analysis of data supported the effectiveness of the play and learn program components in supporting school readiness, and also revealed its effectiveness in enhancing parenting skills.

Moua, Pang

_Bilingual Hmong Women Across Four Decades: Speaking Fundamental Frequency and Fundamental Frequency Variation_ (Poster)

Faculty Mentor(s): Dr. Larry Solberg, College of Education and Professional Studies and the McNair Scholars Program

The purpose of this study is to investigate the speaking fundamental frequency and fundamental frequency variation (pitch sigma) characteristics of bilingual Hmong women across four decades of age: 20-29, 30-39, 40-49, and 50-59 years. Previous research has compared these characteristics in English and other tone languages (e.g., Mandarin and Cantonese) but not Hmong. Research questions are 1) do speaking fundamental frequency and pitch sigma differ between English and Hmong and 2) do speaking fundamental frequency and pitch sigma differ across age groups? Twenty-six Hmong women with no history of smoking, hearing loss, neurological disease, or voice disorder were audio recorded while producing spontaneous speech samples in English and in Hmong. Thirty-second voice samples were analyzed acoustically using the Computerized Speech Lab. The data were analyzed statistically using paired-sample t-tests and Welch’s ANOVAs. Preliminary results revealed that speaking fundamental frequency was significantly higher in Hmong compared to English but that speaking fundamental frequency did not differ significantly across age groups in either English or Hmong. Pitch sigma did not differ significantly between languages produced or the age groups of speakers. Although data collection still is underway, preliminary findings from this study are consistent with published research comparing speaking fundamental frequency and pitch sigma in English and Mandarin.
Pechacek, Matt

Positive Verses Negative Grade Running, Covering the Most Distance While Maintaining A Constant VO2 (Poster)
Faculty Mentor(s): Dr. Joseph O'Kroy, Health and Human Performance

The strategy to optimize performance while running hills has been discussed by runners and coaches for many years; many times unaware of the accuracy of their claims with the current research. Therefore, we investigated the possibility that the distance lost running uphill (running slower) could be recovered during a faster downhill run while at the same work rate (VO2). PURPOSE: To compare the running speed of running at positive and negative inclines while maintaining VO2. METHODS: fourteen collegiate cross country runners (ten males and four females, all data mean ± Standard deviation; age, 20.12 ± 1.05 yrs; height, 174.14 ± 9.21cm; weight, 68.49 ± 9.47 kg) volunteered for this study and signed an approved IRB. VO2 was measured via Parvomedics metabolic cart while subjects ran on a treadmill at three different inclines: 1% grade, the flat condition; 5% grade, the uphill condition; and -5% grade, the downhill condition. Subjects ran on the flat condition during which VO2 was recorded and matched for the uphill and downhill conditions by altering the running speed. Repeated measure ANOVA was used to determine the differences in running speed, ventilation VE and heart rate (HR) between incline conditions. Additionally, a Duncan Post Hoc was used to analyze significant effects found between the incline groups. All at the P <0.05 level. RESULTS: Significant differences were found between the flat, downhill, and uphill conditions with running speeds: 7.18 ± 0.82 mph, 9.69 ± 1.00 mph, and 5.54 ± 0.76 mph, respectively; ventilation: 60.58 ±14.19; 67.95 ± 16.33; and 64.89 ± 14.85, respectively; and heart rate, 155 ± 11 beats compared to 162 ± 12 beats and 161 ± 12 beats, respectively. CONCLUSION: While maintaining a constant work rate, runners can run 0.87 MPH faster downhill than they slowed down while going uphill. This allows runners to significantly recover and gain distance lost while going uphill if they run faster while going downhill without using any additional energy to do so.

Pechacek, Matt

The Effect of Foot Inclination Angle on Lower Extremity Kinematics and Ground Reaction Forces During Running (Poster)
Faculty Mentor(s): Dr. Bryan Heiderscheit, Physical Therapy and Mikel Stiffler, Physical Therapy (UW-Madison)

PURPOSE: Foot inclination angle (FIA), the angle at which the foot strikes the ground during running, has been an area of interest as it relates to injury risk and performance. Specifically, a reduction in foot inclination angle (less rear-strike) has been suggested as a way to minimize bone stress injury risk. The objective of this study was to characterize how gait kinematics and ground
reaction forces are influenced by foot inclination angle among elite runners. As FIA decreases, we hypothesized runners would encounter greater peak vertical ground reaction forces (pVGRFs). A secondary aim was to explore the relationship between FIA measured on a continuum and vertical center of mass (COM) excursion, horizontal distance from heel to COM and stance phase percentage.

METHODS: Three-dimensional kinematics and VGRFs were recorded on healthy male (n=9) and female (n=16) NCAA Division 1 cross country runners at two speeds: preferred and 3.63 m/s. Pearson correlations were calculated between FIA, kinematic variables, and pVGRF.

RESULTS: Smaller FIA were associated with increased pVGRF across both speeds (p <0.001). Decreased FIA was also associated with decreased stance phase percentage (p < 0.001) across both speeds and an increased vertical COM excursion (p < 0.05).

CONCLUSIONS: Our results suggest FIA is significantly associated with pVGRF and other lower extremity kinematics. As excessive pVGRF has been considered a cause of running-related injuries such as patellofemoral and iliotibial band pain, FIA may be a surrogate measure of pVGRF, thereby providing a clinically feasible option for its assessment.

Pemberton, Madeleine

The Impact of Family Resource Center Play & Learn Groups on School Readiness (Poster)

Research Collaborator(s): Katlin Hastings
Faculty Mentor(s): Dr. Molly Gerrish, Teacher Education

Research focused on determining the impact of Family Resource Center Play and Learn groups on school readiness. The purpose of the study was to evaluate the effectiveness of Play and Learn activities and to determine if and how the program can be improved. Areas identified for study included: parent support; health, safety, and nutrition; social and emotional development and relationships; language and communication; approaches to learning; motor development and behavior management. Data was collected through parent and teacher interviews which were analyzed for recurring themes. Triangulation was provided by researcher observations and parent surveys. Evidence reflected that children were benefiting in every learning domain with socialization and language development noted most often by the parents. Data from parents indicated that the support offered in the Play and Learn sessions served to increase parental confidence levels, reduced stress and enhanced the parent/child relationship. These sessions also played a critical role in parental understanding of child development. Analysis of data supported the effectiveness of the play and learn program components in supporting school readiness, and also revealed its effectiveness in enhancing parenting skills.
Peterson-Rucker, Kamyn

*The Role of Self-Regulation in Problem-Solving Activities using Computational Thinking Strategies* (PowerPoint)

Faculty Mentor(s): Dr. Oenardi Lawanto, Engineering Education (Utah State University)

The goal of this research is to understand how student’s self-regulation strategies are used while solving a problem. The specific focus of this research will be on the use of self-regulation strategies commonly applied to solve problems requiring recursive and non-recursive mechanism. Thinking recursively is one of the strategies of computational thinking. Our hypothesis is that students with experience in applying a computational thinking strategy will use different self-regulation strategies than less experienced ones. Computational thinking is popularly defined as a way of solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science. Self-regulation plays an essential role in computational thinking as it requires unique thought processes to bridge the problem to solution space.
URSCA Mentors

We would like to acknowledge the efforts of Faculty and Staff Mentors, whose dedication allows our campus URSCA to thrive. We deeply appreciate their contributions in support of the university’s commitment to undergraduate research, scholarly and creative activity. Thank you!

Below is a comprehensive list, by college, of all of the URSCA Mentors who have students presenting projects at the 2015 Fall Gala.

College of Agriculture, Food and Environmental Sciences

Dr. Jarod Blades, Plant and Earth Science  
Dr. Tim Buttles, Agricultural Education  
Dr. Jill Coleman-Wasik, Plant and Earth Science  
Dr. Holly Dolliver, Plant and Earth Science  
Michelle Farner, Animal and Food Science  
Dr. Terry Ferriss, Plant and Earth Science  
Dr. Veronica Justen, Plant and Earth Science  
Dr. Joel Peterson, Agricultural Engineering Technology  
Dr. Amy Radunz, Animal and Food Science  
Dr. Joseph Shakal, Agricultural Engineering Technology  
Dr. Danielle Smarsh, Animal and food Science  
Dr. David Trechter, Agricultural Economics  
Dr. Kurt Vogel, Animal and Food Science  
Dr. David Zlesak, Plant and Earth Science

College of Arts and Sciences

Dr. Melanie Ayres, Psychology  
Joseph Blum, Stage and Screen Arts  
Dr. Paul Budde, Music  
Dr. Fred Bonilla, Biology
Eoin Breadon, Art  
Grace Coggio, Journalism  
Dr. James Cortright, Psychology  
Dr. Mathew Dooley, Geography and Mapping Sciences  
Bernice Ficek-Swenson, Art  
Dr. Betsy Gerbec, Biology  
Mike Helke, Art  
Dr. Cheng-Chen Huang, Biology  
Erik Johnson, Stage and Screen Arts  
Randy Johnston, Art  
Brett Kallusky, Art  
Dr. Karen Klyczek, Biology  
Dr. Andrew Koob, Biology  
Dr. Timothy Lyden, Biology  
Dr. James Madsen, Physics  
Peter Mak, Art  
Dr. Lowell McCann, Physics  
Dr. Paige Miller, Sociology, Anthropology and Criminal Justice  
Dr. Brad Mogen, Biology  
Dr. Kim Mogen, Biology  
Dan Paulus, Art  
Dr. Charles Rader, Geography and Mapping Sciences  
Dr. Rik Seefeldt, Psychology  
Dr. Surujhdeo Seunarine, Physics  
Dr. Glenn Spiczak, Physics  
Dr. Travis Tubre, Psychology  
Dr. John Wheeler, Biology  
Dr. Todd Wilkinson, Psychology  
Rhonda Willers, Art

**College of Business and Economics**

Dr. Dawn Hukai, Accounting and Finance  
Dr. Claire McCarty, Management and Marketing  
Dr. John Walker, Economics
College of Education and Professional Studies

Dr. Molly Gerrish, Teacher Education
Dr. Joseph O’Kroy, Health and Human Performance
Dr. Sharyl Samargia, Communication Sciences and Disorders
Dr. Larry Solberg, College of Education and Professional Studies

Off-Campus Mentors

Dr. Bryan Heiderscheit, Physical Therapy (UW-Madison)
Dr. Oenardi Lawanto, Engineering Education (Utah State University)
Mike Noreen, River Falls Municipal Utility
Mikel Stiffler, Physical Therapy (UW-Madison)
Questions?

For additional information about upcoming events, grant funding, trainings, and presentation opportunities, visit the URSCA webpage at www.uwrf.edu/URSCA/ or contact the URSCA Office by phone at 715-425-3902 or email at ursca@uwrf.edu.

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