MURRAY STATE UNIVERSITY

SCHOLARS WEEK

Program Booklet

April 18-22, 2011

Updated: April 14, 2011

10th Annual
Scholars Week
Program and Abstracts

Table of Contents

Welcome to *Scholars Week* 2011. This year marks the tenth anniversary of Murray State University's (MSU) ***Scholars Week*** celebration!

The 2010-11 academic year has been very productive for Murray State students and faculty.

As I reflect over the year and accomplishments of our undergraduate students taking part in research, scholarly, and creative endeavors I am continually impressed. Throughout the year, a number of faculty-mentored projects have received financial support through the Office of Undergraduate Research and Scholarly Activity's Mini-Grant Program. Three Research Scholar Fellowships were awarded to undergraduate students who participated in a very competitive review process. MSU again coordinated the *Posters-at-the-Capitol* program in Frankfort, although inclement weather prevented most Murray State students from attending.

This year we continued to see undergraduate students taking part in faculty-mentored learning experiences – coined "high-impact" practices by the American Association for College and Universities – be accepted to state, regional and national conferences. Presentations were not the only outcome; publication of undergraduate student work continued in discipline-specific and multidisciplinary professional journals. Outcomes such as these raise the visibility of our students and open doors to quality graduate programs and career opportunities.

Thinking a bit about the quality of a good graduate program experience, Murray State is making strides there as well. One area of work this year focused on the launch of a program to provide Innovation Research Assistantships at the recommendation of the Research Policy Committee. That program provides individuals accepted into one of Murray State's graduate programs and holding a regular assistantship to compete for one of these highly meritorious packages that covers tuition expenses while they work with a faculty mentor on research. This program is sure to gain additional visibility in the years ahead as we continue to look at ways to strengthen our graduate education offerings.

As the academic year culminates, the University is looking forward to the annual ***Scholars Week*** celebration which recognizes the creative and scholarly work of hundreds of Murray State undergraduate and graduate students. I encourage you to attend as many of this year's ***Scholars Week*** poster sessions, oral presentation sessions, performances and exhibits as possible. I am grateful to you – our students, faculty, and staff – for making this another outstanding year for scholarly accomplishments at Murray State University.

Randy J. Dunn
President

Welcome to the 10th anniversary of ***Scholars Week*** at Murray State University. This university-wide celebration of undergraduate and graduate student research, scholarship, and creative activity is something I look forward to each spring semester.

Research shows us that students engaging in faculty-mentored experiences learn better and have a stronger sense of engagement than those without such opportunities. Murray State University has long supported the types of projects on display at ***Scholars Week*** through our honors, service learning, study abroad, and undergraduate and graduate research programs.

I applaud the efforts of our faculty and staff for continuing to give so generously to our students. I am continually amazed at what they can do when challenged and given necessary support. Whether it is through oral presentations, posters sessions, exhibits, or performances, the results are clear – the students presenting during this celebration are active learners and headed for a bright future.

Please take advantage of all the activities during ***Scholars Week*** and enjoy!

Bonnie Higginson
Provost and Vice President for Academic Affairs

There are no guarantees in life; we all have heard that. It's difficult to guarantee anything, especially a college / university's performance with regard to student learning, but there are some parameters: In the world of accountability in which we all live, critical components of student learning are obvious in courses completed, grades achieved, and ultimately graduation; however, another equally critical component of student learning is in research and scholarship during the undergraduate years. "Traditionally, undergraduate education has taken place in the classroom, while research has been for graduate students and faculty. No more. College and universities are pushing hard to get many more undergraduates involved in research" (Justin Pope, Associated Press, USA Today, Feb. 5, 2007). I am very proud, as a Murray State University faculty member and administrator to share with you that your education here, with tremendous faculty/staff interaction, has been exponentially "ramped up" with regard to undergraduate research under the leadership of the Office of Undergraduate Research and Scholarly Activity. You should be proud of your engagement in scholarship and research during our annual ***Scholar's Week***, working hand-in-hand with professors across all of our colleges, departments, and disciplines. I am very proud to welcome you to this cutting edge event where Murray State University is an equal peer to some of the best research universities in the nation.

There are no guarantees in life, and student learning is difficult to measure; however, your participation in Murray State University's ***Scholar's Week*** is evidence of your success here as a student as well as your success in the not-too-distant-future as a graduate. Don't forget your beginnings, and always remember your alma matre, Murray State University.

Tim Todd
Dean, College of Business

Scholars Week is an exciting event for teacher education and the College of Education and Murray State University. During ***Scholars Week*** our students who will soon be teachers display the scholarship and professionalism that is the norm for education professionals. The display of achievement reflects the quality of our institution and the commitment it has made to the PK-12 education community to improve the educational attainment and quality of life for the citizens of the service region and the Commonwealth.

Students from each college within the university have prepared exhibits and presentations that reflect the application of their academic knowledge to a better more healthy, educated, inclusive and peaceful world. I encourage you to visit the displays representing the thinking and scholarship of the disciplines representing a university to personally congratulate the young scholars for their outstanding work and thoughtful contribution

As Interim Dean of the College of Education, I welcome you to ***Scholars Week*** and trust you will be impressed with the display of knowledge and the hospitality and friendliness of our students, faculty, college and university.

Renee Campoy
Interim Dean, College of Education

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On behalf of the College of Health Sciences and Human Services, welcome to ***Scholars Week***! The college journey is a unique time in life where new beginnings for learning and life experiences take place. ***Scholars Week*** is an amazing opportunity for learning and scholarship potential. Please join us in celebrating accomplishments of the many talented individuals at Murray State University. This event showcases undergraduate and graduate students' exhibits in intellectual and creative roles within their fields of expertise. Remember, whatever you choose in life, "Go confidently in the direction of your dreams. Live the life you've imagined" (Henry David Thoreau).

James "Corky" Broughton
Dean, College of Health Sciences and Human Services
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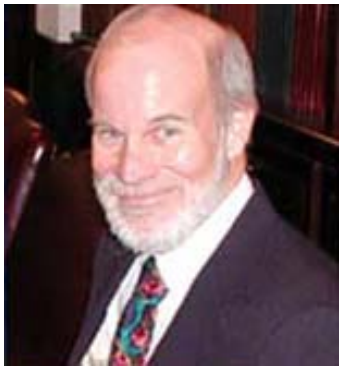

Murray State University's ***Scholars Week*** provides an exciting opportunity to recognize and celebrate the academic achievements of our undergraduate and graduate students, showcasing the results of their scholarly and creative projects. Research, fundamental and applied, is an essential component of our curricula. Throughout history, major discoveries and new knowledge have been essential to human progress. Through active research agendas and creative endeavors, our faculty and students explore the boundaries of their disciplines and expand our realm of possibilities. Discovery though research and creative activity encourages a sense of relevance and excitement as new knowledge is applied to society, industry, and beyond. The faculty in the College of Humanities and Fine Arts work together with their students on research and creative projects in classrooms, clinics, and studios, becoming partners in the exploration of disciplines and the acquisition of new knowledge. This partnership expands the abilities of our students to think independently, creatively, and critically. As one of the leading universities in the region, this is our ultimate mission.

Ted Brown
Dean, College of Humanities and Fine Arts

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MSU's ***Scholars Week*** is a time for us to celebrate the research, scholarship, and creative accomplishments of our students. During this week, we have the opportunity to recognize and affirm those students who have demonstrated their commitment to their disciplines by pursuing learning beyond the confines of the classroom. In addition, we honor those faculty who have invested their time, talents, and resources to involve students in a richer learning experience. The posters and exhibits presented this week are evidence of MSU's dedication to creating a student-centered learning environment where students are encouraged to pursue excellence in their creative and academic achievement. The College of Science, Engineering, and Technology is happy to support ***Scholars Week***, and congratulates all who participate.

Steve Cobb
Dean, College of Science, Engineering, and Technology
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On behalf of the Hutson School of Agriculture, I would like to welcome you to this unique opportunity to celebrate research, scholarly, and creative activity. It is also a time to showcase our dedicated faculty who are devoted to the personal and professional growth of our students. Life is a journey with many avenues. As you participate in this event, you will view the numerous ways the University is committed to academic excellence as well as providing the opportunity to explore these avenues. Through activities like ***Scholars Week***, Murray State University and the Murray State University Hutson School of Agriculture offers its students the opportunity to get an education instead of just a degree. I would like to commend all the participants in this event.

Tony Brannon
Dean, Hutson School of Agriculture

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While the accomplishments of our students is a constant point of pride to Murray State University, ***Scholars Week*** stands out as it gives us an opportunity to highlight the amazing research and creative activity performed by some of our best and brightest students. Much like the faculty who work with these students firsthand, those of us here in the University Libraries have the good fortune to participate in the learning and growth that accompanies these student endeavors. The excellent displays you will see during ***Scholars Week*** are the visible result of that learning, and help demonstrate the value Murray State University places on teaching, research and service excellence.

On behalf of the faculty and staff of the University Libraries, welcome!

Adam Murray
Dean, University Libraries
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Scholars Week at Murray State is a time of sharing our student's accomplishments with the entire University community. This time of sharing gives us an opportunity to showcase the thinking and creative skills our students possess and provide evidence of all of our student's ability to think "outside the box", to creatively solve problems and to synthesize not just memorize knowledge. We are proud of our students, their abilities, their work ethic and their accomplishments. Welcome to ***Scholars Week***!

Michael Perlow
Interim Dean, School of Nursing

A Welcome from the Undergraduate Research and Scholarly Activity Advisory Board and Staff

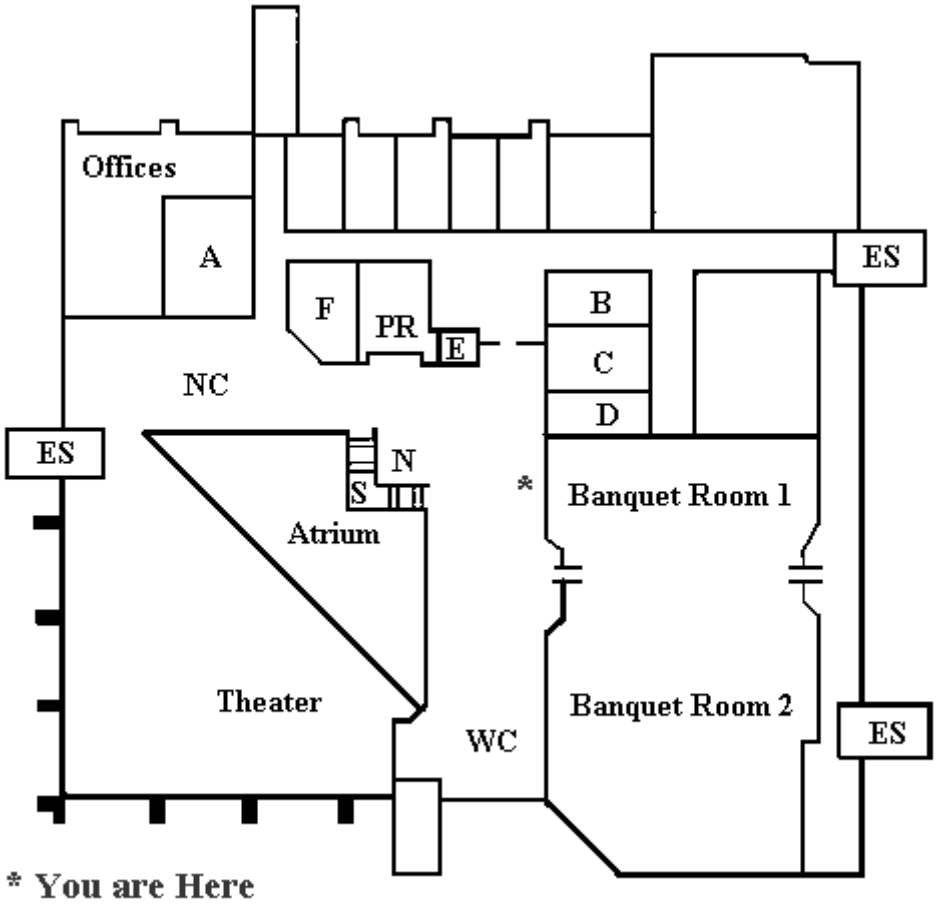
On behalf of the Undergraduate Research and Scholarly Activity Advisory Board and staff, welcome to our tenth annual ***Scholars Week*** celebration. We are pleased that over the past ten years that several thousand Murray State University undergraduates and graduate students have had the opportunity to present their research, scholarly, and creative works to the university community.

The work displayed in this year's ***Scholars Week*** abstract booklet represents thousands of hours of effort on behalf of Murray State's students and faculty. To our students, you are to be commended for your dedication and effort! Your efforts will be rewarded when you apply to graduate school or when you look for that first job. To the faculty, you are helping our students succeed and this is among our greatest rewards.

Please join the URSA Advisory Board and staff in celebrating the accomplishments of our students by attending as many of the ***Scholars Week*** events as possible. Our young scholars need your continued support!

Advisory Board and Staff:

Dr. Terry Derting Biological Science	**Dr. Daniel Hepworth** SWK, CRJ, & GER	**Dr. Zbynek Smetana** Art
Dr. Meagan Musselman Education	**Dr. Joyce Shatzer** Education	**Dr. Paula Waddill** Psychology
Dr. Terry Holmes Business Administration	**Dr. David Eaton** Economics and Finance	**Dr. David Ferguson** Agriculture
Dr. Pat Williams Agriculture	**Dr. Kelly Kleinhans** Communication Disorders	**Dr. Harry Fannin** Chemistry
Mr. Dieter Ullrich Library	**Dr. John Mateja** URSA	**Mr. Jody Cofer** URSA



A – Barkley Room
B – Ohio Room
C – Mississippi Room
D – Cumberland Room
S – Center Stairs
NC – North Concourse
E – Elevator
F – Tennessee Room
N – Crow's Nest
PR – Public Restrooms
ES – Emergency Stairs
WC – West Concourse

Scholars Week Schedule

Monday, April 18, 2011

Poster Session

Sigma Xi Poster Competition
Large Ballroom, Curris Center
Session Chair: Dr. Daniel Johnson
9:00 a.m. – 12:00 p.m. Poster Set-Up
12:00 p.m. – 4:00 p.m. Poster Judging
* *Undergraduate*
** *Graduate*

Nathaniel Bundy* and Leslie Potts*
*Distinguishing Between Red and White Mulberries (*Morus rubra and M. alba*) and Their Hybrids*

Brianna Cassidy* and Dylan Benningfield*
Emerging New Pollutants in Western Kentucky Waters: Bisphenol A and Triclosan Levels in Water Samples from Various Sources

Michael Creed**, Christina Jackson*, Dan Varonin*, and Sudan Loganathan*
Identification and Analysis of Tudor protein-associated Components of Germ Granules in Drosophila Ovary

Brett Davis **
Comparing Kentucky Index of Biotic Integrity (KIBI) and Landcover: Is There a Relation?

Samantha Erwin* and Aron Huckaba*
Using Matrix Analysis to Model the Spread of an Invasive Plant, Alternanthera philoxeroides

Morgan Geile* and Jessica Whitaker*
From Field to Lab: An Overview of Salamander Population Studies and Genetic Analysis

Gavin Hale**
Historical and Cultural Implications of LBL Cemeteries in Lyon County, Kentucky

Robin Holland*
Pedigree Analysis to Determine the Mode of Inheritance of White Markings in the Norwegian Fjord Horse

Dan Jenkins**
Using GIS To Find Clusters of High and Low Mean ACT Scores for Kentucky Counties

Erin Keeney* and Callie Wilson*
Adaptive Immunity Is Not Energetically Costly

Aaron Lattin**
Crime "Hotspot" Analysis of Grand Rapid, Michigan

Katie LeBlanc*
Soil Quality Responses to Land Management Uses

Katie LeBlanc*
Assessing Land Management Quality Using Soil Physical Properties

Sudan Loganathan*
Occurrence of Bisphenol A in Indoor Dust Samples from Kentucky and New York and Implications for Human Exposures

Sudan Loganathan*, Mahamoud Elsayed*, Dan Varonin*, and Amber Kelly*
Characterizing Germline Stem Cell Development Using Drosophila melanogaster

Victoria Martin**
The Role of Humor and Personality in Well-Being

Basma Mohamed**
Comparing Urban Sprawl of Atlanta, Georgia and Portland, Oregon, Using Remote Sensing and GIS

Charles Morgan**
Spatial Interpolation of Water Quality Parameters in Kentucky Lake

Ajadi Olaniyi**
A Geospatial Approach to Map and Analyze Crimes in Kentucky Counties

Tony Piercy*
A Microsurgical Procedure to Generate Neural Stem Cells

Ryan Prusinski**
Comparing Land Use/Land Cover Change in Variably Managed Sub-catchments of the Buffalo National River Watershed, Arkansas

Coy St. Clair**
Atrazine Exposure Lengthens Cannibalistic Latency in a Dragonfly Larva, Libellula luctuosa

Thomas Werfel*
Dielectric Barrier Discharge for Living Tissue Sterilization

Oral Sessions

Humanities Session
Ohio Room, Curris Center
Session Chair: Dr. ZB Smetana
9:30 a.m. - 11:30 a.m.

Shraddha Chakradhar and Autumn Ehrenberg
The Life and Works of Frances Greensted

Dominique Duarte
The Music Major Experience: Examining Perceptions of and Preparedness for the Core Curriculum

Kala Dunn
The River as God in Mark Twain's Life on the Mississippi

Ginny Furches
When, Why and How to Begin Second Language Education

Shelby Goodlad
Does Book Design Really Matter?

Jessica Minyard
The Second Circle

Richard Osban
German Anti-partisan Warfare on the Eastern Front and its Roots, 1941-1945

David Schmoll
Welcome to Dairy Queen: Growing up in Fast Food

Caroline Grace Sharpe
The Good, the Bad, and the Ugly: Utilizing Conflict Theory to Analyze Religious and Media Representation of Angels

Kristen Tinch
Accessible, Visual, and Active: Using Graphic Novels to Improve Adolescent Literacy in Kentucky

Freshman Reading Experience Essay Contest Winner's Session
Ohio Room, Curris Center
Session Chair: Dr. Josh Adair
3:30 p.m. – 5:00 p.m.

Allison Crawford
Patriotism

Claire Crocker
Rebecca Worthy's Use of Language

Morgan Geile
Are We Prepared for the Next Pandemic?

Tyler Spann

Mathematical Biology Session
Mississippi Room, Curris Center
Session Chair: Dr. Maeve McCarthy
3:30 p.m. – 5:00 p.m.

Shelby Blalock and Jared Guthrie
Maximum Likelihood Estimation

Julia Freeman and Andrew Brigham
Survival of the Fittest: An Exploration into Charles Darwin's World

Erin Keeney and Meredith Stevenson
Wrights F-statistics in Genetic Differentiation

Mark Stanley
Epidemic Modeling of the Black Death, Influenza, and HIV

Alysha Taylor and Amber Mills
The Mathematical Models of Stem Cells and their Role in Cancer

Jeffrey Young and Caleb Roberts
Comparing Zero-Inflation Models to Logistic Regression Models in Chytridiomycosis Research

Joshua Mercer
Modeling a Smallpox Biological Attack as an Epidemic

Tuesday, April 19, 2011

Oral Sessions

Asking Questions Early Session I:
Research Projects from Hon 161
Mississippi Room, Curris Center
11:00 a.m. – 12:15 p.m.
(1st Half of Course, Listed in Alpha Order)

Abby Bert

Kathleen Bert

Jessica Bishop

Claire Crocker

Brandon Hoehn

Erica Jarvis

Hannah Lanter

James McCallon

Shera Melton

Kellie Money

Liberal Arts Session I
Ohio Room, Curris Center
Session Chair: Dr. Barbara Cobb
12:30 p.m. – 2:30 p.m.

Sara Brewer
Food Issues: Assessing Awareness and Behaviors

Margaret Cude
Religion in the Jackson Purchase, 1990-Present

Amanda Davenport
Feminism and Rhetoric in Vice Presidential Speeches of Geraldine Ferraro and Sarah Palin

Ryan Lantrip
Organizational Assessment of Social Service Agencies of Murray, Ky. with a Focus Needs Assessment and Program Evaluation

Modern Language Senior Colloquium
Mississippi Room, Curris Center
Session Chair: Dr. Meg Brown
2:00 p.m. – 5:00 p.m.
(listed in alphabetical order)

Kehla Baker
The Influence of the Marginalized in Nueva York by Federico Lorca

PiTiffany Bradley
Merkel and Obama: How it Happened

Miranda Brown
Gloria Anzaldúa's Borderlands/La Frontera: Re-engaging the Indigenous Roots of Chicana Identity

William Cartwright
The Romanticization of the Image of Che Guevara

Andrew Courtney
Federico Garcia Lorca: The Fight for Liberation Throughout Much of Early Spanish History

Jenafer Dummitt
Passion and Practical Love

Sarah Fuller
The Mexican Cinderella

Kyle Kineman
Goodbye, Innocence: Children in French Film

Maria Paramo
Higher Education for Illegal Immigrants

Rachel Turley
L'Oreal, Orange, and Renault: French Companies Expanding Across the World through Advertising

Mary Shelley's Frankenstein Session
Ohio Room, Curris Center
Session Chair: Dr. Kelley Wezner
2:30 p.m. – 4:00 p.m.

Patrick Archer
Frankenstein's Monster as Multiple Doppelgangers

LaDonna Cronch
Male Desire of Acceptance and Fear of Inadequacy Within Contemporary Society According to Mary Shelley's Frankenstein

Morgan Hillard
Embracing the Unknown

Samuel Hook
The Existential Forge and Frankenstein

Jennifer Kissiar
Dissociative Identity Disorder in Frankenstein

Carrie Overton
The Expectations of Beauty and Experience of the Sublime in Mary Shelley's Frankenstein

Other Sessions

Gender Equity in the Climate Crisis
Barkley Room, Curris Center
Session Chair: Ms. Sarah Kelty
12:30 p.m. – 1:20 p.m.

Panelists:

Dr. Ian Handayani, Hutson School of Agriculture

Dr. Steve Jones, College of Health Sciences and Human Services

Dr. David Pizzo, College of Humanities and Fine Arts

Awards Recognition Reception
Faculty Club
4:00 p.m. – 5:30 p.m.
(Faculty & Staff Only)

Dr. Iin Handayani, Assistant Professor Agricultural Science, 2011 Recipient of the University Distinguished Mentor Award

Dr. Juyoung Song, Assistant Professor of English, 2011 Recipient of the Alumni Association's Emerging Scholar Award

Dr. Robert Martin, Professor of Biological Sciences, 2011 Recipient of the Alumni Association's Distinguished Researcher Award

Sigma Xi Banquet
Large Ballroom, Curris Center
Contact: Dr. Claire Fuller
6:00 p.m. – 8:00 p.m.
(For Sigma Xi Members, Competition Participants, and Invited Guests)

Performances

Guest Artist Recital by Brett White
(euphonium)
Farrell Recital Hall
6:00 p.m. – 7:00 p.m.

New Music at MSU
Performing Arts Hall
7:30 p.m. – 9:00 p.m.

Wednesday, April 20, 2011

Poster Session

General Poster Session
Small Ballroom, Curris Center
9:00 a.m. – 11:30 a.m.
Students will be with their posters from 10:30 a.m. to 11:30 a.m.
*** Sigma Xi Poster Competition Participant*
**** American Humanics or Service Learning Posters*

Jaclyn Acree, Tyler Spann, and Hillary Lyons***
Humane Society & Animal Shelter

Nathaniel Bundy and Leslie Potts**
*Distinguishing Between Red and White Mulberries (*Morus rubra and M. alba*) and Their Hybrids*

Susan Camp, Justin Parrish, Tanner Wyatt, Scott Coleman, John Michael Puckett, Trent Murdock, Ben Paschall, Robert Stuard, and Kalie Vowell
2010 Evaluation of Dark Tobacco at Murray State University

Will Cartwright, Ally Simon, and Melissa Michel***
Big Brothers/Big Sisters

Brianna Cassidy and Dylan Benningfield**
Emerging New Pollutants in Western Kentucky Waters: Bisphenol A and Triclosan Levels in Water Samples from Various Sources

Ashlee Cobb
Late Adolescent Identity Stages and Depression

Allison Coleman and Ashley Smith
Acceptability of Brownies Prepared Using Non-fat and Low-fat Yogurt as Substitutes for Oil

Michael Creed, Christina Jackson, Dan Varonin, and Sudan Loganathan**
Identification and Analysis of Tudor protein-associated Components of Germ Granules in Drosophila Ovary

Jasmine Crosier, Ewa Wantulok, and Zachary Brantley***
Main Street Youth Center

Brett Davis **
Comparing Kentucky Index of Biotic Integrity (KIBI) and Landcover: Is There a Relation?

Desiree Davis and Shawn Greenwell***
The Dove Campaign for Real Beauty: Self Esteem Workshop

Ellie Doom and Lyndsee Elledge***
Needline Hygiene Program

Margaret Downing
The Acceptability of Three Antioxidant Rich Chocolate Bars as a Candy Bar Alternative

Claire Dunlap, Trey Jurgens, and Alex Kursave***
Big Brothers/Big Sisters

Samantha Erwin and Aron Huckaba**
Using Matrix Analysis to Model the Spread of an Invasive Plant, Alternanthera philoxeroides

Lisa Exner
The Acceptability of Yellow Squash as a Partial Fat Replacement in Yellow Cupcakes

Lance Fulks
Affective and Cognitive Components of Music Preference in Musicians and Non-Musicians

Morgan Geile and Jessica Whitaker**
From Field to Lab: An Overview of Salamander Population Studies and Genetic Analysis

Gavin Hale**
Historical and Cultural Implications of LBL Cemeteries in Lyon County, Kentucky

Hannah Hamilton, Candace Nevels, and Torree Rogers***
Big Brother/ Big Sister Student Recruitment Event

Katherine Hartley and Megan Colson
Acceptability of Stevia and Fruit Puree as Partial Sugar and Fat Subsitution in Chocolate Chip Cookies

Robin Holland**
Pedigree Analysis to Determine the Mode of Inheritance of White Markings in the Norwegian Fjord Horse

John Janacek and Mike Brawner
Effects of Pomegranate Molasses Substitute on Ginger Cookies

Dan Jenkins**
Using GIS To Find Clusters of High and Low Mean ACT Scores for Kentucky Counties

Erin Keeney and Callie Wilson**
Adaptive Immunity Is Not Energetically Costly

Krystyn Koch
Community Prevalence: Stigma Towards the Mentally Ill in Rural Communities

Lacey Latimer
The Acceptability of Avocado as a Partial Substitute for Milk in Creamy Tomato Soup

Aaron Lattin**
Crime "Hotspot" Analysis of Grand Rapid, Michigan

Katie LeBlanc**
Soil Quality Responses to Land Management Uses

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Assessing Land Management Quality Using Soil Physical Properties

Sudan Loganathan**
Occurrence of Bisphenol A in Indoor Dust Samples from Kentucky and New York and Implications for Human Exposures

Sudan Loganathan, Mahamoud Elsayed, Dan Varonin, and Amber Kelly**
Characterizing Germline Stem Cell Development Using Drosophila melanogaster

Emily Lowery and Ali Shecraft
The Acceptability of Chocolate Chip Cookies Prepared Using Pureed Pear, Peach, or Kiwi as a Fat Ingredient Substitutes

Victoria Martin**
The Role of Humor and Personality in Well-Being

Hailey McDaniel
Acceptability of Red Velvet Cupcakes Prepared with Avocado Additive for Greater Health and Nutritional Benefits

Anna McNeil
Acceptability of Macaroni and Cheese Made with Whole Wheat Noodles and Vitamin Enriched Water

Rachel Miller, Jacque Garrard, and Toni Baker***
Senior Citizen Mental Alertness Activity

Becca Mitchner, Joe Forman, and Sarah Wylie***
Big Brothers/Big Sisters

Basma Mohamed**
Comparing Urban Sprawl of Atlanta, Georgia and Portland, Oregon, Using Remote Sensing and GIS

Charles Morgan**
Spatial Interpolation of Water Quality Parameters in Kentucky Lake

Hannah Mullis, Victoria McBride, and Jess Nall***
Big Brothers/Big Sisters

Amanda Nowak, Jamie Kloenne, and Lori Milligan***
Main Street Youth Center Pancake Breakfast

Kirby O'Donoghue, Courtney Billington, and LaTreze Mushatt***
Big Brother/Big Sister Halloween Event

Ajadi Olaniyi**
A Geospatial Approach to Map and Analyze Crimes in Kentucky Counties

Tony Piercy**
A Microsurgical Procedure to Generate Neural Stem Cells

Jonathan Powers
Acceptability of Inulin as a Replacement for Oil in Cake and Sugar in Icing

Topaz Prawito
Soil Organic Carbon and Nitrogen associated with Three Tall Fescue Grass Varietie

Ryan Prusinski**
Comparing Land Use/Land Cover Change in Variably Managed Sub-catchments of the Buffalo National River Watershed, Arkansas

Jordan Ringham, Annie Noltemeyer, and Robert Shearon***
Hickory Woods

Caroline Schmidt, Caitlin Nichols, Jackson Neary, Kevin Colbert and Randall Mitchell***
Service Learning Projects in ARC 350: Public Archaeology

Brittany Simons and Sarah Lewis
The Acceptability of Various Fat Replacements in Oatmeal Fruit Cookies

Claire Smith
A Potential Death to the Family

Coy St. Clair**
Atrazine Exposure Lengthens Cannibalistic Latency in a Dragonfly Larva, Libellula luctuosa

Tanesha Tabers and Lisa Stone
The Use of Various Yogurt Variations in a Fruit Smoothie

Kristen Tinch
Accessible, Visual, and Active: Using Graphic Novels to Improve Adolescent Literacy in Kentucky

Ruojong (Audrey) Wang
Comparing and Contrasting Relational Closeness and Distance between Chinese and Americans

Vincent Waniel
Online Privacy: Is Internet Usage on a Public Terminal Private, Safe, and Secure?

Michael Washburn
Tall Fescue Forage Management Effects on Soil Physical Properties

Thomas Werfel**
Dielectric Barrier Discharge for Living Tissue Sterilization

Ellen Yoffie, Autumn Denton, and Derick Thomas***
Murray/Calloway Senior Citizens Center

Meagan Young and Erica McKinney
Acceptability of Chocolate Cake with Canned Pumpkin as a Substitute for Fat

Alaina Zloty, Julie Liliker, and Jessica Elkins***
Calloway County Humane Society

Oral Sessions

Occupational Safety and Health Session
Mississippi Room, Curris Center
Session Chair: Dr. Tracey Wortham
9:30 a.m. – 10:30 a.m.

Martika Clark
Electronic Device Distracted Driving Survey

Travis Martin, Robert Hughes and Chen (Jamie) Xiaojing
Ergonomic Analysis of Material Handling in a Warehouse Facility

Stephanie Miller, Anna Newmaster and Scott Zigrye
Muscoloskeletal Disorders Developed by Gastroenterologists

Hunter Pingston and Langdon Dement
Ergonomic Assessment of a Refrigerated Dough Processing Factory

"Attacking" Renaissance Session I Research Projects from Art 418
Ohio Room, Curris Center
Session Chair: Dr. ZB Smetana
9:30 a.m. - 10:30 a.m.

Diedra McMullen
Giorgione's Tempest

Caitlin McDonald
Raphael's Stanze

Courtney Cotton
Raphael's Madonnas

College of Education: Student Teacher Eligibility Portfolios
Crows Nest, Curris Center
Session Chair: Ms. Jeanie Robertson
9:30 a.m. – 1:30 p.m.

Jessica Bouland - Elementary Education

Anna Michelle Smith - Interdisciplinary Early Childhood Education

Jennifer Solomon - Elementary Education

Adam Underhill - History/Social Studies

Alysha Fleming - Learning and Behavior Disorders/Elementary Education

Rachel Mauser - Art

Katelyn Gillum - English

Social Sciences Session
Tennessee Room, Curris Center
Session Chair: Dr. Paula Waddill
1:30 p.m. – 2:30 p.m.

Rachel Fielder
Effectiveness of Combining Approaches from Speech Pathology and TESOL for Improving Pronunciation in Native Korean Speakers Learning English as a Second Language

Robert Klope
When Down is Good: Head Position Affects Moral Attribution to Music

Chloe Williams
Values and the Perception of Necessity

Liberal Arts Session II
Ohio Room, Curris Center
Session Chair: Dr. Barbara Cobb
2:00 p.m. – 4:00 p.m.

Shraddha Chakradhar
What is Good Science Writing?

Nate Cox
Wal-Mart's Effect on the Benton, Illinois Community

Jameson Hill
Recruitment and Retention of Volunteers; What Nonprofit Organizations Need to Know

Lucy Love
Propaganda: An Analysis of the National Socialist Party Method

Sabrina Prusinski
The Governess in 19th Century Art and Literature

Political & National Identity
Mississippi Room, Curris Center
Session Chair(s): Drs. Ann Beck & Reika Ebert
3:00 p.m. – 5:00 p.m.

PiTiffany Bradley
Political Parties: How Identities are Formed

Lee Darnell
Turkish-German Identity in Film: The Edge of Heaven

Matthew Hall
Nationalism, Anarchism, and Identity

James Kendall
Political Identity and Religion

Brian Kinnaman
Berlin: a Nation's New Voice

Teris Moodie
Assimilation and Political Participation Among Hispanic Americans

Richard Osban
Germany and the National Question: Bavarian Identity

Alexandra Simon
Language Policy in Multilingual South Africa

BioMaps Mini-Symposium
Barkley Room, Curris Center
Session Chair: Dr. Renee Fister
3:30 p.m. – 5:00 p.m.
(listed in order of presentation)

Samantha Erwin and Aron Huckaba
Using Matrix Analysis to Model the Spread of an Invasive Plant, Alternanthera philoxeroides

Morgan Geile and Jessica Whitaker
From Field to Lab: An Overview of Salamander Population Studies and Genetic Analysis

Erin Keeney and Callie Wilson
Adaptive Immunity Is Not Energetically Costly

Bryce Norris
Montezumas Revenge: Learn Math to Save a Life

Other

President's *Scholars Week* Luncheon
Large Ballroom, Curris Center
Moderator: Provost Bonnie Higginson
11:30 a.m. – 1:00 p.m.

Remarks: President Randy J. Dunn

Performance:

Robert Arneson and Cody Martin, Duo-Pianists Performing Movements One and Two from Poulenc's "Sonata"

Recognition of:

1. MSU Alumni Association's Distinguished Researcher Award Recipient
2. MSU Alumni Association's Emerging Scholar Award Recipient
3. MSU Distinguished Mentor Award Recipient
4. MSU Service Learning Mentor of the Year

Thursday, April 21, 2011

Oral Sessions

Service Learning Mentor of the Year Session
Ohio Room, Curris Center
Session Chair: Dr. Kelly Rogers
11:00 a.m. – 12:00 p.m.

To Enhance Learning through Service; and to Apply Our Learning to Better Serve Our Communities presentation by Dr. Robin Zhang, Associate Professor of Geosciences and Recipient of the 2011 Service Learning Mentor of the Year Award, and Students

Asking Questions Early Session II:
Research Projects from Hon 161
Mississippi Room, Curris Center
11:00 a.m. – 12:15 p.m.
(2nd Half of Course, Listed in Alpha Order)

Kirstie Nashtock

Hannah O'Daniel

Kirby O'Donoghue

Sarah Peddie

Jordan Ringham

Andrea Schepers

Caroline Schmidt

Jennifer Stampor

Andrew Taylor

Thomas Via II

Alyssa Wallach

Watershed Studies Institute

Research Symposium
Barkley Room, Curris Center
Session Chair: Dr. Howard Whiteman
12:30 p.m. - 4:30 p.m.

Thomas Anderson
The Impacts of Egg Predation by Paedomorphic Mole Salamanders on Competitive Interactions

Patibandla Brahmaiah
Temporal Trends of Trace Metals and Persistent Organic Chemicals in Tree Rings from Western Kentucky

Brett Davis
Fish Community Response to Phragmites *Removal at Clear Creek Wildlife Management Area*

Amy Krzton-Presson
Effects of Common Reed Management on Reptile and Amphibian Populations in Clear Creek Wildlife Management Area

Joshua Lambert
Better Estimating Biodiversity using Zero-Inflated Distributions

Todd Levine
Shell Structure and Burrowing Behaviors in Freshwater Mussels

Adam Martin
Crappie Population Trends in Kentucky and Barkley Lakes

Jared Militelo
Movement, Habitat Use, and Diet Selectivity of Re-introduced Juvenile Alligator Gar, Atractosteus spatula, *in Clarks River, Kentucky*

Shangwu Peng
Carbamazepine Concentrations in Western Kentucky Watershed

Kirk Raper
Effects of Herbicidal Removal of Common Reed on the Diet of Lake Chubsucker in Clear Creek

Caleb Roberts
*Effects of Elk (*Cervus elaphus*) Browse on Woody Plant Communities*

Nissa Rudh
The Noisy Stream

Coy St. Clair
Atrazine Exposure Lengthens Cannibalistic Latency in a Dragonfly Larva, Libellula luctuosa

Mathematics Session
Tennessee Room, Curris Center
Session Chair: Dr. Rob Donnelly
1:30 p.m. – 2:30 p.m.

Joel Cates
Exploration into Fractals Resulting from the Classical Cantor Set

Joshua Charles Hyatt
Distributivity and Modularity from the structure of the Poset of Irreducibles

Meredith Stevenson
A Comparison among Traditional Methods in Survival Analysis and Generalized Additive Models for Location, Scale and Shape

Bridget Stitchnot
Fractals: The Von Koch Curve

Economics Session
Ohio Room, Curris Center
Session Chair: Dr. David Eaton
2:00 p.m. – 4:00 p.m.
Abdullah Alshaie
The Role of Government in Economics

Jennifer Hayden
Behavioral Finance and Modern Portfolio Theory

Sarah Moss-Crisp
Are You Ready for an Upgrade?

Politics in Its Many Guises
Mississippi Room, Curris Center
Session Chair: Dr. Ann Beck
2:00 p.m. – 5:00 p.m.

Xue Bai
The Future of U.S. - China Relations

Paula Cissell
Electronic Medical Records: The Impact on Patient Privacy

Joseph DeLapp
U.S. Farm Bills: Subsidizing the Demise of the Future Farming in America

Katie Gaines
Motivational Learning: The Impact of Intrinsic Motivation on Student Learning

Dennie Roger Leach
Case Study: Lithuanian Seimas and the Open-List Electoral Connection

Charles James
Expanded Gaming in Kentucky, the Runaway Train

Zachary Park and James Chamberland
The Obama Effect: How President Obama's Registration Efforts Influenced the Election

Grant Price
The Use of Power in Organizations by Muted Group Members

Elizabeth Ribar
Parties vs. Leaders: British Voting Patterns

Ashley Rose
How Women Vote in the Kentucky State Legislature

David Schmoll
Israeli Voting Patterns During Wartime

Andrew Snyder
The Controversy of Standardized Testing

Other

How to Make Your Campus Greener Award Ceremony
Outside, Carr Health
Contact: Ms. Sarah Kelty
2:00 p.m. – 3:00 p.m.

Faculty Recognition Banquet
Large Ballroom, Curris Center
Contact: Ms. Donna Miller
6:00 p.m. – 7:30 p.m.
(Faculty and Professional Staff Only)

Performance

Symphonic Band, Symphonic Orchestra, and Concert Band Concert
Lovett Auditorium
7:30 p.m. – 9:00 p.m.

Friday, April 22, 2011

Oral Sessions

"Attacking" Renaissance Session II
Research Projects from Art 418
Ohio Room, Curris Center
Session Chair: Dr. ZB Smetana
9:30 a.m. - 10:30 a.m.

Elizabteh Lawrence
Bramante's Tempietto

Madeline Bartley
Boticelli's Primavera

Justine Schurig
Michelangelo's Medici Chapel

Classical Literature Session
Mississippi Room, Curris Center
Session Chair: Dr. Kelley Wezner
9:30 a.m. – 11:00 a.m.

Alexa Adams
Aeschylus's Eumenides: Explored Through Neil Gaiman's Sandman

Kelsey Chadwick
Helen, Andromache, and Hecuba: The Role of the Trojan Women in The Iliad

Kala Dunn
An Equal Common Person: Slaves and Social Stratification in Euripides's Medea

Jane Austen's Emma Session
Mississippi Room, Curris Center
Session Chair: Dr. Kelley Wezner
1:30 p.m. – 3:00 p.m.

Alexa Adams
To Remain a Spinster Was a Luxury the Poor Could Not Afford: Marriage in Jane Austen's Emma

Ashlee Cobb
Patriarchal Society and Unconscious Guides in Austen's Emma

Sean Ashley Curd
Sine Qua Non: Feminine Sublimation and Deconstruction in Emma

Rachael Isom
Patroness as Pupil: Educational Exchange in Jane Austen's Emma

Shannon Stafford
Performing Emma

Performance

Senior Recital by Aaren Cadd (soprano)
Performing Arts Hall
6:00 p.m. – 7:00 p.m.

Senior Recital by Gracie Wallace (violin)
Performing Arts Hall
7:30 p.m. – 8:30 p.

Special Recognition

2010-2011 Undergraduate Research Scholar Fellowships

Recipient	Faculty Mentor
Caleb Roberts	Dr. Howard Whiteman
Kristen Tinch	Dr. Meagan Musselman
Vincent Waniel	Dr. Michael Bowman

2010 MSU Alumni Association Distinguished Researcher Award Recipient

Dr. Michael Bokeno, College of Business

2010 MSU Alumni Association Emerging Scholar Award Recipient

Dr. Timothy Johns, College of Humanities and Fine Arts

2010 MSU Distinguished Mentor Award Recipient

Dr. James Davis, Hutson School of Agriculture

Alexa Adams - Creative Writing
Mentor: Kelley Wezner
Aeschylus' Eumenides: Explored Through Neil Gaiman's Sandman

In Aeschylus' Oresteia, Clytemnestra murders her husband Agamemnon out of revenge for his murder of their daughter. She is, in turn, killed by her son, Orestes, in retribution for his father's death. It is this act that set the Furies (or Eumenides, or Kindly Ones) into motion. The Furies are underworld goddesses who are responsible bringing those who have spilled the blood of their own family to justice. The Furies work for Clytemnestra's memory, to bring her son to justice for her death. In Neil Gaiman's Sandman graphic novel series, the Furies are adapted into his story of Morpheus, the personification of Dreams. Hippolyta Hall calls on the Furies to avenge the death of her son, and they choose Morpheus as the object of their hounding mental and physical torture. The Furies are described as worse than Gorgons; they are the most horrible and terrifying things that anyone can imagine. And yet they willingly aid Clytemnestra and Hippolyta Hall. Why are these women worthy of being taken in as honorary Furies? What are the differences and similarities in Gaiman's adaption of these mythological Furies in his modern work as compared to Aeschylus' version of the Furies? Clytemnestra and Hippolyta are both strong women who are capable of getting what they want, but their lifestyles and reasons for needing the Furies differ greatly. What they have in common is their need of aid from the Kindly Ones, and their place in society as strong women.

Alexa Adams - Creative Writing
Mentor: Kelley Wezner
To Remain a Spinster Was a Luxury the Poor Could Not Afford: Marriage in Jane Austen's Emma

Emma Woodhouse, the protagonist of Jane Austen's Emma, flaunts the fact that she does not want or need to get married. She does this until the point she realizes the extent of Mr. Knightley's affection toward her. She has the option to stay single because, with the exception of Mr. Knightley, any man in Highbury that she might marry would result in a drop in both her wealth and social status. However, Austen's secondary heroines, Jane Fairfax and Harriet Smith, do not have the option of refusing proposals. They have status, but no money. Their options are to marry well, or to hope for a decent job, such as a governess or companion. All three women marry or are set to be married by the end of the novel. Emma has married the one man who improves her wealth, and both Jane and Harriet have married above their class and secured their futures through the unions to Frank Churchill and Robert Martin, respectively. In this essay, I explore the different reasons and motivations that the women in Jane Austen's novels faced when it came to marriage, and why they settled on the aberrant choices that they did. I will discuss why Emma chose to marry Knightley and the influence that this had on Jane and Harriet.

Abdullah Alshaie - Economics
Mentor: David Eaton
The Role of Government in Economics
As there is "No such thing as a free lunch" in economic perspective, the economic problem of what to produce and how to produce and to whom to produce is the main case. What is the necessity of life for an individual and how should recourses be allocated to society? Should recourses be allocated through the role of market or the role of government? For example, how should the health care, the education system, the water industry, and the electric service be allocated?

Thomas Anderson - Waterscience
Mentor: Howard Whiteman
The Impacts of Egg Predation by Paedomorphic Mole Salamanders on Competitive Interactions
Intraguild predation in larval salamander guilds is an important ecological force that can influence competitive interactions. Predation on salamander egg stages by guild members, however, has not been examined but could directly affect competition experienced by that predator. Selective predation on guild member eggs by aquatic mole salamanders (paedomorph) could influence competition dynamics for themselves and their progeny. The goal of this study was to assess whether paedomorphic mole salamanders can act as egg predators on conspecific and congeneric egg masses. Twenty-four aquariums were filled with water, fifteen of which contained leaves with alternate invertebrate prey items, and nine that received no leaves. Each tank received one of three egg treatments: mole eggs, spotted eggs, or both species. Six predation attempts were determined to have occurred (two in the no-leaves, and four in the leaves treatments). All but one predation attempt occurred on mole salamander eggs, but no differences were observed within either the leaves or egg treatments. Though palatable, it appears that mole egg masses are not a primary dietary item, whereas consumption of spotted masses is extremely limited. Predation by paedomorphs on only mole alamander eggs may be due to differences in the physical structure of the egg masses. Spotted salamander egg masses are covered in a firm gelatinous coating that may be impenetrable, whereas mole egg masses are more pliable, resulting in easier access to the embryos. Egg predation by paedomorphs, therefore, does not appear to be a prevalent ecological phenomenon that would influence interspecific competitive interactions.

Patrick Archer - Creative Writing
Mentor: Kelley Wezner
Frankenstein's Monster as Multiple Doppelgangers
Frankenstein's Monster has often been seen as a doppelganger for Victor Frankenstein himself. However, the monster can also be viewed as a doppelganger for the other victims throughout the text.

Xue Bai - Political Science
Mentors: Ann Beck
The Future of U.S. - China Relations
The relationship between the United States and China is one of the most important bilateral relationships of the twenty-first century. China's rise to the second largest economy in the world in 2010, reconfirmed again the importance the relationship between U.S and China. By examining current articles written by scholars from four different areas -- United States, China, Europe, and other Asian countries, this paper presents those scholars opinions on the future of the U.S.-China relations. The paper predict that even though the U.S. and China have different social structures and different cultures, a conflict between the U.S. and China in the near future is not inevitable due to their highly interdependent economies and growing societal connections, more and more shared interests among global issues between the two countries, and policymakers' awareness of the horrible outcomes if either country strikes each other with nuclear weapons.

Kehla Baker - Spanish Education
Mentors: Mica Howe and Meg Brown
The Influence of the Marginalized in Nueva York by Federico Lorca
Federico Lorca is a famous poet, playwright, and dramatist known for his ability to make his readers and viewers truly feel his emotions. While reading Lorca, it is easy to feel the passion and anguish that he tries to portray. His life, scattered with highs and lows, was his primary source of inspiration. Whether it was from his childhood experiences or young adulthood, there are evidences of Lorcas personal experiences in all of his works. One of his more notable works, Nueva York, allows readers to see a side of Lorca that was never so openly discussed: his homosexuality. As a result of this, Lorca uses Nueva York as a tool to display his empathy for not only homosexuals but also other minorities that he encounters during his time in New York, such as the African Americans and women. This study will delve into the influences of minorities in Federico Lorcas Nueva York and examine specific examples of how Lorca empathized with each one.

Shelby Blalock – Biology and Jared Guthrie – Mathematics
Mentor(s): Maeve McCarthy and Christopher Mecklin
Maximum Likelihood Estimation

Modern statistics is dominated by a technique known as maximum likelihood estimation.This specific approach deals in approximating a set of parameters for particular occurrences that would imply that the observed set of data was most likely out of a given number of outcomes.The goal of this method revolves around choosing each parameter such that the likelihood of the observation is as large as possible.These maximized parameters become our maximum likelihood estimates, or simply our best guess at the parameters. It often becomes necessary to employ the logarithm of the likelihood (log-likelihood) in order to simplify otherwise difficult computations.This method of statistical analysis inherits certain drawbacks such as an assumption of a large data set, whereas this is not always possible.Yet maximum likelihood analysis remains the best matched in analyzing data from many biological studies, including ecology and genetics.We will provide an overview of the method of obtaining these parameters, specifically from the binomial distribution.Then, we will examine the importance of likelihood estimates in the fields of ecology and genetics.In ecology we estimate probabilities.For example, the binomial distribution is useful in modeling predation. If we are interested in finding the probability of a successful kill, then we estimate this probability parameter.Biologically, maximum likelihood statistics plays a major role in genetic adversities.It can detect DNA modifications, natural selection, and genetic drift.Specifically with genetic drift, likelihood statistics helps to model population size by measuring allele frequencies.

PiTiffany Bradley – German and International Affairs
Mentor: Meg Brown
Merkel and Obama: How it Happened

Chancellor Angela Merkel of the Federal Republic of Germany and President Barack Obama of the United States of America have set a new course of history. From a western traditional and historical standpoint neither candidate fit the mold of past heads of government: They are not white males. Yet, they were both were elected to a position of power, a position of leading their respective countries. Merkel became the first female chancellor of Germany, while Obama became the first black president of the United States. In both countries there is a history of social movements. In Germany in the 1970s there was the Women's Movement that pushed for equality and rights for all women. The 1960s saw a time of protests and marches in the United States for the rights of its African American citizens. These movements lead to the equal rights that both women in Germany and African Americans in the United States enjoy today. But under what conditions did the leadership of Merkel and Obama become possible? It could be an accumulation of the past 50 years of fighting for equality by thousands of people in social movements. Their ascension to leadership could also be based solely on their individual personalities and political agendas during the election process. This research looks at these questions and makes an attempt to answer them by looking not only at the history of social movement in Germany and America, but also at the experiences, agendas, and actions of the two candidates who eventually became the leaders.

PiTiffany Bradley – German and International Affairs
Mentor: Reika Ebert
Political Parties: How Identities are Formed
One of the ways in which people express their political identity is through the assumption of a party label. Democracies, because they often promote diversity, organize the election system through the use of numerous political parties. This research analyzes the way in which the two major political parties in Germany, the Christian Democratic Union and the Social Democratic Party, implement and market their platforms to get other's to accept, even temporarily, a similar political identity. I examine how the two parties use various elements of the German national identity to mobilize the citizens to act in a unified manner.

Patibandla Brahmaiah - Biology
Mentor: Bommanna Loganathan
Temporal Trends of Trace Metals and Persistent Organic Chemicals in Tree Rings from Western Kentucky
Pollution trend monitoring studies are useful in understanding the historical contamination, present status and to predict future trends. A variety of environmental (sediment, ice cores) and biological matrices (pine needles, bivalve mollusk, fish, human tissues etc.) are used to describe trends of various pollutants. Trees act as biological indicators and help in the assessment of environmental contamination by relating concentration in annual growth rings to atmospheric deposition. In this study, tree rings are used to trace the temporal trends of metal and organic contaminants in western Kentucky. Pine tree cores samples were collected from Paducah gaseous diffusion plant, Calvert City, Belmont Park, West Waco Paper mill, High Way 937 using a Teflon coated increment borer. Sample extraction for trace metal analysis includes microwave acid digestion by Mars 5 Xpress microwave acid digester. An Inductively Coupled Plasma Mass Spectrometry is being used to analyze the samples.

Sara Brewer - Liberal Arts
Mentors: Barbara Cobb and Chris Purser
Food Issues: Assessing Awareness and Behaviors
I will provide an overview of various environmentally related food issues including factory farming, local versus global markets, organic foods, and genetically modified foods. I have conducted a survey assessing students' awareness of these types of food production and the impact of the level of awareness on their behavior regarding food. I will conclude with a possible plan of action to raise awareness on this college campus.

Miranda Brown - Spanish
Mentor: Mike Waag
Gloria Anzaldúa's Borderlands/La Frontera: Re-engaging the Indigenous Roots of Chicana Identity
Many writers have explored the notion of the Borderlands as a cognitive space, as a cultural, social, and mental place of mixed cultures, suspended between two or more social systems, creating a mosaic of customs, ideals, and myths. In her book of essays and poetry, Borderlands/La Frontera: The New Mestiza, Gloria Anzald'a details the struggles of the "new mestiza," the Native American-Spanish-Anglo American mix of three cultures that makes up her own unique culture, struggling for acceptance by its three parent cultures. Anzald'a expresses her conception of the Borderlands through texts which organically mix Spanish and English, thereby presenting a complete interpretation of Chicano culture through the doubled expressive power of connotations in both languages. She correlates this linguistic hybridity with the blending of gender roles and other levels of her Chicana experience. Analyzing this experience, Anzald'a constantly frames her perspective in terms of paradoxes of identity, conflicts of cultural allegiance, which she presents as modern manifestations of the Aztec-Nahua-influenced worldview of nepantla. The study specifically explores how Gloria Anzald'a uses bilingual texts, comparisons between the various levels of her Chicana experience, and identity paradoxes to demonstrate that the modern Chicana woman can go so far as to liberate herself from oppression by reviving a suppressed indigenous cosmo-vision.

Nathaniel Bundy and Leslie Potts - Biology
Mentor: Dayle Sarr
Distinguishing Between Red and White Mulberries (*Morus rubra and M. alba*) and Their Hybrids
White Mulberry (*Morus alba*) is a widespread, non-native weedy species in the US, which readily hybridizes with the native Red Mulberry (*M. rubra*). Present criteria to distinguish between Red and White Mulberry, utilized for over 150 years, are unreliable, based on our DNA analyses. Taxonomists have relied almost exclusively on the degree of leaf pubescence (hairs); heavy on Red vs. little or none on White. Our research uses molecular markers to identify pure species as well as interspecific (between-species) hybrids. These molecular fingerprints demonstrate that some individuals of White Mulberry have as much pubescence as Red Mulberry, which has led to many individuals of pubescent White Mulberry being misidentified as Red Mulberry. Based on our preliminary data, present maps probably show an inflated geographic range for Red Mulberry, including states where the true Red Mulberry does not actually exist. In at least one state where Red Mulberry may not exist, it appears that the misidentified pubescent White Mulberry has been declared threatened in that state. Currently, we are comparing our DNA identifications with trees in an effort to discover more reliable morphological characters for field identification. Leaf vein patterns appear to be much more reliable than pubescence, and more testing is underway to confirm this. We are also surveying the status of Red Mulberry in Kentucky to determine if pure individuals exist in significant numbers, or if it is being swamped-out through hybridization with White Mulberry. Results of this study will be communicated to appropriate conservation agencies.

Susan Camp, Justin Parrish, Tanner Wyatt, Scott Coleman, John Michael Puckett, Trent Murdock, Ben Paschall, Robert Stuard, and Kalie Vowell - Agriculture
Mentor(s): David Ferguson, Bobby Hill, Andy Bailey, Chris Rodgers, Gutav Helmers, and Iin Handayani
2010 Evaluation of Dark Tobacco at Murray State University

Study 1: (Camp, Parrish, and Wyatt) ***Evaluation of Different Rates and Combinations of Sulfentrazone and Clomazone in Dark-fired Tobacco***

In the herbicide trial, the objective is to determine the best rate combinations of sulfentrazone (Spartan 4F) and clomazone (Command 3ME) either incorporated or applied to the soil surface and not incorporated prior to transplanting. There were fifteen different herbicide treatments in the experiment. Treatments 1-7 were incorporated after spraying, treatments 8-14 were sprayed, but not incorporated, and treatment 15 was a control with no herbicides applied. Treatments 1 and 8 had sulfentrazone applied at a rate of 0.25 lb ai/A. Treatments 2 and 9 had clomazone applied at a rate of 0.75 lb ai/A. Treatments 3 and 10 had sulfentrazone applied at a rate of 0.33lb ai/A. Treatments 4 and 11 had clomazone applied at a rate of 1.0 lb ai/A. Treatments 5 and 12 were a mixture of sulfentrazone at a rate of 0.17 lb ai/A and clomazone at 0.5 lb ai/A. Treatments 6 and 13 were a mixture of sulfentrazone at a rate of 0.25 lb ai/A and clomazone at 0.75 lb ai/A. Treatments 7 and 14 were a mixture of sulfentrazone at a rate of 0.33lb ai/A and clomazone at 1.0 lb ai/A. Throughout the growing season, the control of six different weeds were observed in the plots. The weeds were yellow nutsedge (*Cyperus esculentus L.*), redroot pigweed (*Amaranthus retroflexus L.*), morning glories species (*Ipomoea sp.*), johnsongrass (*Sorghum halepense L.*), prickly sida (*Sida spinosa L.*) and ragweed (*Ambrosia sp.*).

Study 2: (Coleman, Puckett, and Murdock) ***The Effect of Increased Potassium Levels on Tobacco Crop Yield***

This field trial assesses the effectiveness of increased rates of potassium on a tobacco crop. This is done to determine the effect of additional potassium on the overall yield of the plant. The soil test taken from the Murray State University farm indicates potassium levels in a lower than adequate range to produce a crop of tobacco. This suggests an application of a total of 220 pounds K_2O following the prescribed fertilizer recommendations given by the University of Kentucky Cooperative Extension Service to achieve the adequate amount required for the production of tobacco. The experimental setup consists of four different application rates of potassium, these levels represent 220 (the initial recommendation), 293 (133% of recommended level), 365 (166% of recommended level), and 440 (200% of recommended level) pounds K2O per acre. The base rate of 220 pounds of K_2O per acre was applied pre-plant to the entire field. The application of the additional differing rates of potassium is obtained by using the banded side-dress application method in the first week after transplanting of the crop. All other nutrient fertilizer amounts were met according to the recommendations allocated by the University of Kentucky Cooperative Extension Service. The 16 trial plots are arranged in a randomized plot plan to limit the possibility of variation that may arise due to preexisting field conditions. Results will become available at the end of the season.

Study 3: (Paschall, Stuard, and Vowell) ***The Impact of Various Side-dress Nitrogen Sources on Dark-fired Tobacco Growth and Yield***

Nitrogen (N) is the primary nutrient for tobacco growth and production. To improve the N fertilizer efficiency, side-dress applications have to be used during the vegetative growing season. This method will yield better return on investment compared to one time N application. Therefore, the purpose of this study was to evaluate the effect of different side-dress N sources on the growth and yield of dark-fired tobacco after transplanting. The variety used was PD7318 dark-fired tobacco. The tobacco was transplanted on June 15, 2010. There were seven treatments used in the experiment with all treatments receiving 150lbs N/acre of side-dress nitrogen. All treatments received 150 lbs N/acre from urea + DAP prior to transplanting. Phosphorus and K fertilizers were applied prior to transplanting based on soil recommendations. The side-dress N sources were: control (no N side-dress application), Sulfur N-26, 50:50 blend of N-26+urea, NH_4NO_3, UAN, UCAN-21 and KNO_3. All the N sources were applied on July 9, 2010, except for UAN that was applied on July 13, 2010. Each treatment had four replications and the plot was four rows wide. The tobacco was harvested September 22 to October 6, 2010.

Joel Cates – Mathematics
Mentor: David Roach
Exploration into Fractals Resulting from the Classical Cantor Set

Classical Cantor Set forms the foundation for multiple fractal formations. This work will look into different fractal relations stemming from use of the Classical Cantor Set.

Brianna Cassidy and Dylan Benningfield - Chemistry
Mentor: Bommanna Loganathan
Emerging New Pollutants in Western Kentucky Waters: Bisphenol A and Triclosan Levels in Water Samples from Various Sources
Bisphenol A (BPA) and triclosan (TCL) are widely used in industrial and consumer products. Widespread use of these chemicals leads to environmental contamination. Earlier studies have documented that exposure to BPA and/or TCL causes harmful health effects in aquatic and terrestrial animals, including humans. BPA and TCL are lipophilic, and therefore easily absorb into cells and bind to intracellular endocrine disruptors to bring about estrogenic activity. BPA is known to cause various developmental and reproductive toxicities in wildlife and humans. TCL is a thyroid hormone disruptor and can inhibit lipid biosynthesis and can affect livers of various organisms. Despite their widespread distribution and harmful effects, no study conducted on contamination levels of these compounds in our regional waters exists. Knowledge on contamination levels of BPA and TCL is essential in order to prevent future contamination and protect wildlife and humans from negative health effects. In this study, BPA concentrations were measured in several brands of bottled water and in natural water samples from Bee Creek, Clarks River and Kentucky Lake. TCL was measured in wastewater treatment plant samples, Bee Creek, Clarks River and Kentucky Lake. For comparison purposes, water samples were also analyzed for BPA and TCL from Red Duck Creek and Mayfield Creek, Mayfield, Kentucky. Enzyme-Linked Immunosorbent Assay was used to measure the target analytes. Results revealed that detectable levels of BPA and TCL were found in all samples analyzed. The results were compared with published reports and evaluated the potential exposure pathways of BPA and TCL to wildlife and humans in this region.

William Cartwright – Spanish and History
Mentors: Susan Drake and Meg Brown
The Romanticization of the Image of Che Guevara
Ernesto Che Guevara is one of the most glorified and romanticized figures in Latin American history. In 1951, as a young medical student in Argentina, Guevara decided to make a road trip with his friend Albert Granado through South America. This journey would define an unmistakable image. Che and everything he represented developed into a social movement that has taken over mainstream media, creating an image that invokes different connotations across the globe. His image has been romanticized, and his face can be seen on posters, t-shirts, and even lunchboxes. This presentation will look at development of Che as a global image that creates different sentiments to people depending on where their political socialization falls on the political spectrum.

Kelsey Chadwick - English/Literature and Spanish
Mentor: Kelley Wezner
Helen, Andromache, and Hecuba: The Role of the Trojan Women in The Iliad
Literature often reflects the time period in which it was written, giving readers valuable information about the cultural and historical context. In this manner, Homer's Iliad helps to inform our understanding of ancient Greece and Trojan society. The author's characterization of the Trojan women within the epic poem provides an interesting commentary on accepted gender roles during this era, pointing specifically to the woman's roles regarding sex, family, and country. Even though the three Trojan women only make limited appearances throughout the epic poem, Homer defines them effectively through dialogues, relationships, and comparisons with other characters. Using both mortal and immortal personalities, Homer also creates connections between classical goddesses and the Trojan women to identify both the characteristics desired of women as well as their adherence to or deviation from these standards. Other classical works that develop characterizations of Helen, Andromache, and Hecuba also provide viewpoints from other authors regarding the role of women in literature from ancient Greece which will be considered in conjunction with the epic. Using depictions of the three Trojan women, I analyze the role of women in ancient society, as well as the cultural and historical implications of these positions.

Shraddha Chakradhar - Liberal Arts
Mentor: Barbara Cobb
What is Good Science Writing?
Science writing is writing about the sciences for a general audience. It is meant not only to be informative or educational, but interesting as well. Given the real need for science education among the general population, knowing effective methods of science writing so future science writers can implement them in their writing is crucial. This particular project, designed to determine some of the methods and characteristics found within good science writing articles, involved surveying scholarly articles for information regarding effective strategies employed not only in science writing, but also science communication as well as science (and general) education. Based on those findings, well-reviewed articles published as part of The Best American Science and Nature Writing series and chapters from Life Ascending, a book that won the Royal Society's prize for Best Science Writing Book, were examined to pick out effective techniques they exemplified. The project also includes a section which brings in personal views about what made the articles and chapters effective as science writing from the perspective of the reader. The final portion of the project involves writing an article that incorporates the characteristics and methods that were derived in the research portion.

Shraddha Chakradhar - Liberal Arts and Autumn Ehrenberg - Secondary English Education
Mentor: Kevin Binfield
The Life and Works of Frances Greensted
The subject of our presentation is Frances Greensted, an English working class poet from the late eighteenth century. Greensted published only a single volume entitled Fugitive Pieces, yet was able to secure over 1900 subscribers. This is a remarkable feat for a new poet of the time, particularly one who was female and lower class. We plan to provide a brief introduction to Greensted and her work, as well as a summary of our textual, literary, and historical analyses of the piece. To our knowledge, no other formal research has been done on Greensted, so our presentation will also discuss (to a lesser extent) the rewards and frustrations of the research process.

Paula Cissell - Political Science
Mentor: Ann Beck
Electronic Medical Records: The Impact on Patient Privacy
Patient privacy is a subset of healthcare and law due to the Health Information Portability and Accountability Act (HIPAA) of 1996 which protects patient's medical information. The next move in health information is to electronic medical records (EMR) which was outlined in the American Recovery and Reinvestment Act to move patient information to electronic form by the year of 2014. EMRs would be the best way to ensure that patient privacy is maintained by private practitioners. Patient privacy is evaluated by looking at the total number of reported HIPAA violations in the United States. With the onset of Electronic Medical records, there will be a need to create new regulations and safe guards to protect patient information based on current legislation.

Martika Clark – Occupational Safety and Health
Mentor: David Fender
Electronic Device Distracted Driving Survey
Drivers can be distracted for many reasons and one growing cause is electronic devices. A survey was conducted on 4 different days in Murray on drivers and their use of electronic devices while driving. The results of the survey will be presented.

Ashlee Cobb - Liberal Arts
Mentor: William Zingrone
Late Adolescent Identity Stages and Depression
This study will examine the relationship of Identity achievement and depression. Undergraduate students (n =100) will be administered Becks Depression Scale (BDI) and the Extended Objective Measure of Ego Identity (EOM-EIS2) to discern their levels of depression and identify their identity stage. The BDI evaluates the severity of depressive symptoms according to the DSM-IV. The EOM-EIS2 (1986), created by Adams and his colleagues, is a written questionnaire comprised of 64 questions related to the areas identity stages encompass: vocation, religious identity, gender roles, political affiliation, and family/career priorities. Stages of Identity determined by the EOM-EIS2 defined by James Marcia are diffusion, foreclosure, moratorium, and identity- achieved. Diffusion is no crisis, no commitment. Foreclosure is no crisis and a commitment. Moratorium is crisis, no commitment. Identity-Achieved is crisis and commitment. The EOM-EIS2 is based on Marcias Identity Status Interview. It is predicted that students in the moratorium and foreclosure stages will exhibit a higher correlation with depression measures than identity-achieved and diffusion stages. The results of this study may benefit psychotherapists dealing with adolescent depression due to struggling with identity issues. Psychologists may realize their patient displays depressive symptoms due to their identity status instead of environmental pressures.

Ashlee Cobb - Liberal Arts
Mentor: Kelley Wezner
Patriarchal Society and Unconscious Guides in Austen's Emma
Emma Woodhouse is a strong, intelligent, and seemingly independent protagonist, but many of these characteristics are suppressed by Mr. Knightley's reprimands and by their marriage at the end of the novel. The only intelligent and powerful female character Austen depicts in Emma is Mrs. Churchill; moreover, she depicts Mrs. Churchill as one of the most hated characters. Mrs. Churchill and Emma are both clever and wealthy, but Austen uses Mrs. Churchill as an example of whom Emma could become if left without a patriarchal superior. Mrs. Elton is another character illustrating Emma's negative personality traits; she, too, serves as a warning. To counter this possibility, Austen uses Emma's two key and male influences, Mr. Knightley and Mr. Woodhouse, to support patriarchal society and male domination through the strong influence each male has over intelligent and independent Emma. In Austen's depiction of patriarchal society, the characters of Mrs. Churchill and Mrs. Elton illustrate how women are supposed to act, including submissiveness and obedience, qualities which neither Mrs. Churchill, Mrs. Elton, nor Emma possess. Using both positive and negative characters in relation to Emma, Austen suggests that her idea of womanhood opposes Mary Wollstonecraft's ideas of women. Although Emma is not the ideal woman, she is a new, submissive creature willing to accept her need of a man by the end of the novel. Austen uses Emma to exemplify the positive aspects of patriarchal society and her own ideas regarding womanhood, which do not include reforming gender roles or society.

Allison Coleman and Ashley Smith - Nutrition
Mentor: Kathy Timmons

Acceptability of Brownies Prepared Using Non-fat and Low-fat Yogurt as Substitutes for Oil

Brownies were prepared using non-fat and low-fat yogurt as a replacement for oil in order to lower the amount of fat they contained. The brownies were then tested for acceptability of appearance, color, texture, and flavor by laboratory panels. Moisture of the brownies was determined using wettability testing, and the volume of the brownies was also tested using a vernier caliper.

Andrew Courtney - Spanish Education
Mentor: Leon Bodevin
Federico Garcia Lorca: The Fight for Liberation Throughout Much of Early Spanish History
Oppression can be seen within various cultural groups. Federico Garca Lorca experienced much of this oppression throughout his lifetime. Lorca, being a native born Spaniard, was segregated due to his homosexuality. In many of the works of Lorca, he addressed these issues of social, cultural, and political oppression. Lorca used his writing as a way to try to liberate the oppressed from these oppressions and to criticize the society of Spain. He was very fascinated with the gypsies and the African people because they experienced the same types of oppressions as he. Many of these ideas can be seen in Lorca's drama, La casa de Bernada Alba. In the play, Lorca describes a house where the mother is strict and does not allow the daughters to seek sexual relations. Many of the themes in this play relate to the ideas of oppression. Some may even argue that the play represents Lorca's life, since he was not allowed to freely practice his own relationships due to the fact that he was a homosexual. With these writings, readers can feel the obstacles Lorca and others experienced throughout their lifetime, but it is with these obstacles that helped Lorca and others liberate themselves from such oppressions.

Nate Cox - Liberal Arts
Mentors: Dan Shope, Barbara Cobb and Lillian Daughaday
Wal-Mart's Effect on the Benton, Illinois Community
This project provides an assessment of the effect that the Wal-Mart Supercenter has had on the community of Benton, Illinois since the entry of the Wal-Mart Supercenter in June, 2005. I grew up in Benton and have witnessed the stages of adjustment that it made due to the growing success of the Wal-Mart Supercenter. Today, the stores that once housed private businesses in Benton now serve as antique shops for antique-lovers from all over the US. This project provides an analysis of how much the Wal-Mart Supercenter accounts for this change. The results of my analysis will help determine any social changes that have occurred within the community, for example, if Benton's citizens have become more or less interactive due its loss of private stores. This research could also reflect the adjustments that other rural communities in America have had to make due to the presence of Wal-Mart. This should provide us with a clearer picture of the both the benefits and costs of having a Wal-Mart in a rural community.

Allison Crawford – Conservation Biology
Mentor: Josh Adair
Patriotism
Patriotism is an important quality in a citizen, especially during times of war. In Thomas Mullen's novel, The Last Town on Earth, World War I causes split perspectives on patriotism. As the Spanish flu rips through the nation and a war rages overseas, the people of Commonwealth attempt to isolate themselves from the chaos. The country outside is split into those who support the war and those who disapprove, and Commonwealth's self quarantine causes outsiders to doubt its patriotism.

Michael Creed, Christina Jackson, Dan Varonin, and Sudan Loganathan - Biology
Mentor: Alexey Arkov
Identification and Analysis of Tudor protein-associated Components of Germ Granules in Drosophila Ovary
Germ cells in many animals contain ribonucleoprotein particles, germ granules. Composition of these evolutionarily conserved granules and their functional role are not well understood. In various organisms, Tudor domain-containing proteins are the crucial germ granule components. In Drosophila, Tudor protein contains 11 Tudor domains protein-protein interaction modules which bind to methylated amino acids of target proteins, for example, Piwi family proteins. Here, we used a biochemical approach to identify Tudor-associated proteins in Drosophila ovary. Tudor protein complex was stabilized by chemical crosslinking, purified, and analyzed by mass spectrometry. In addition to Piwi protein Aubergine, we identified DEAD-box RNA helicase and cytoskeleton proteins as specifically present in Tudor complex. Structure-function analysis of Tudor-associated proteins is in progress and will be discussed. Our data suggest that multiple Tudor domains of Tudor protein are redundantly used for interaction with the same protein and also specifically required for trafficking and localization of germline determinants.

Claire Crocker - Pre-Veterinary Medicine
Mentor: Josh Adair
Rebecca Worthy's Use of Language
It's not what you say but how you say it. You can understand a great deal about a person by analyzing their use of language. This paper evaluates Rebecca Worthy's use of language and how it categorizes her as a transitional character.

LaDonna Cronch - Secondary Education
Mentor: Kelley Wezner
Male Desire of Acceptance and Fear of Inadequacy Within Contemporary Society According to Mary Shelley's Frankenstein
In Mary Shelley's Frankenstein, the creature reflects male desire of acceptance and fear of inadequacy within contemporary society. Most of the characters who are abandoned and orphaned--Victor's mother, Elizabeth, Justine, and Safie-- are not only female but also successful at securing a place within society by making herself indispensible to a group. The only other orphan, the creature, is never accepted by society; he is angry because he cannot find a "use" for his existence and fears his social inadequacy. He seeks the inter- and intra- personal relationships of the cottage people and learns language and history, only to realize he has no correlation to it. Additionally, every male character exhibits fears of inadequacy or weakness and cannot overcome these fears without female assistance and encouragement. Shelley portrays the unrecognized and unacknowledged roles of women within society: Walton requires encouragement from his sister; Victor requires encouragement from Elizabeth as well as Justine (upon her death), and Felix requires the presence of Safie to free him from his miserable existence. The creature also realizes his dependency on female sympathy and asks for a female counterpart to complete him; the creature is ultimately unsuccessful because he lacks a female counterpart. Ironically, Shelley is often questioned as the "true" inventor of the novel; Perch writes the forward and she accredits her husband's "incitement" upon the creation of the book. It seems she wanted to portray that her success was accidental and completely reliant upon her husband.

Margaret Cude - Liberal Arts
Mentor: Barbara Cobb
Religion in the Jackson Purchase, 1990-Present
This multidisciplinary study will look at the changes in religious affiliation from 1990 to 2000 by analyzing information from the U.S. Census Bureau. As the 2010 Census data concerning religion is not yet available, major news stories from 2000 to the present will be used as case studies of people’s attitudes in this area.

Sean Ashley Curd - English Literature
Mentor: Kelley Wezner
Sine Qua Non: Feminine Sublimation and Deconstruction in Emma
Jane Austen's multilayered novel, Emma, functions as a textual brocade of feminist poststructural thought that serves a performative function as commentary on social and literary conventions. To this end, the works of Luce Irigaray, H'l'ne Cixous, and Gayatri Chakravorty Spivak are brought to bear; this application of 20th century theoretical developments to a 19th century text is not a retroactive misappropriation, but a linking of female creators whose textual bodies defy categorization through a process of transformation that opposes the calcifying effect that is present within the phallogocentric Western literary canon. The author also contends that Jacques Derrida's concept difference is important because a reader must continually engage in an act of comparison between disparate viewpoints within Emma's narrative. Furthermore, using Derrida□s concept to contrast binary pairs within Emma complicates reader's interpretations and justifies the novel's designation as a scriptible text. The aim of this essay then is to recognize that an acknowledgment of the unique feminine language theorized by Irigaray and Cixous allows readers to grasp the textual contradictions that collide and pull at one another in Emma. Indeed, Austen's text is effusive and undecidable, and rebels against lisible interpretations, forcing the reader to play an integral role in processing the meaning of the text.

Lee Darnell - German and Japanese
Mentor: Reika Ebert
Turkish-German Identity in Film: The Edge of Heaven
This research project analyzes the cultural aspects and challenges of Turkish-German citizens based on the film "Auf der Anderen Seite" (The Edge of Heaven), by Fatih Akin. I am interested in the nature of Turkish-German identity. The primary focus of this paper will discuss these questions: What kind of Turkish-German identity does this film project? How does the film portray the cultural differences between Turkey and Germany? How do Turkish-Germans identify themselves within this film? By analyzing specific scenes, one can begin to gain a general understanding of a Turkish-German identity.

Amanda Davenport - Liberal Arts
Mentor: Barbara Cobb
Feminism and Rhetoric in Vice Presidential Speeches of Geraldine Ferraro and Sarah Palin
This study looks at how the vice presidential candidate's rhetoric was used to represent feminist or antifeminist ideals. Ferraro and Palin ran on different parties thirty years apart. My rhetorical analysis of their speeches identifies the different types of appeals used at the party's national convention.

Brett Davis - Water Science
Mentor: Tom Timmons
Fish Community Response to* Phragmites *Removal at Clear Creek Wildlife Management Area
Phragmites australis is an invasive aquatic plant found throughout most of the United States. This plant has been shown to alter wetland hydrology and is related to a decline in larval fish assemblages and egg development. Effective control and eradication of Phragmites is an option for biologists who wish to return affected wetlands to their pre-invasion state. Clear Creek Wildlife Management Area (WMA) is an 858 acre property located in Hopkins County, KY that is heavily impacted by the invasion of Phragmites. The Kentucky Department of Fish and Wildlife Resources treated half of the WMA with herbicide in fall 2009 to restore the wetland by removing the Phragmites and allowing native flora to return. The goal of this project was to study the effects of this removal on the fish community. Following treatment, three locations (Phragmites treated, Phragmites untreated, and non-Phragmites) were selected and sampled by seining and electroshocking. Each sample was scored and compared using the Kentucky Index of Biotic Integrity (KIBI), the Shannons Biodiversity Index (SBI), and the Jaccards Similarity analysis. The average KIBI and SBI values illustrated no significant difference among the three sampling locations. However, the treatment area had the highest single KIBI and SBI value during the study and highest ratio of species per individuals sampled. Additionally, the Jaccards Similarity analysis indicated a divergence in the fish community composition at the treated location compared to the untreated location. These results highlight the importance of monitoring habitat restoration efforts to guide future management attempts.

Brett Davis - Water Science
Mentors: Tom Timmons and Robin Zhang
Comparing Kentucky Index of Biotic Integrity (KIBI) and Landcover: Is There a Relation?
The use of Geographic Information Systems (GIS) in the field of fisheries management is a relatively new idea. Biologists are, however, beginning to understand the analytical power GIS can provide. For fisheries biologists, one of the most important concepts is how land use practices in a watershed affects the quality of a fish community and the habitat of a stream. One of the most widely used field sampling methods for determining the quality of a stream is the Index of Biotic Integrity (IBI). This index evaluates a sample of fish based on a series of metrics and calculates a numerical score that is compared to a regional standard for quality. These narrative classifications range from ‘very poor’ to ‘excellent’ based on the fish community present in the sampled stream. Combining the IBI point data throughout the state of Kentucky with landcover GIS layers, the relationship between land use characteristics and stream health can be visualized and analyzed geographically. Modeling the biotic integrity values for each watershed as a function of agricultural land use, a statistical relationship can be established between two.

Desiree Davis – Criminal Justice and Shawn Greenwell – Psychology
Mentor: Roger Weis
The Dove Campaign for Real Beauty: Self Esteem Workshop
Our project was held on November 6, 2010 from 1-3 p.m. at the Main Street Youth Center located on S. 4th Street in Murray Kentucky. We partnered with the Dove Self-Esteem Fund to produce and facilitate our version of the Dove Campaign for Real Beauty Self-Esteem Workshop. We held open discussion with girls aged 13-16 and did fun activities to promote self-awareness and performed self-reflection exercises in which we asked the girls to write about what makes them unique and different from their peers. We showed a variety of video clips that displayed the importance of recognizing that images we see in the media are not always realistic representations of beauty.

Joseph DeLapp - Public Administration
Mentor: Ann Beck
U.S. Farm Bills: Subsidizing the Demise of the Future Farming in America
There are problems with agriculture subsidies in how they affect the future of farming in the United States. Summarizing data collected from newspapers, articles, books, and statistical information from the Department of Agriculture, the Environmental Working Group, and the Census Bureau, this paper evaluates the claims of whether specific subsidies in the current farm bill lead to excessive payments to nonqualified farmers, many environmental concerns, and the overall affect they have for agriculture business in both the large corporate and small family farms. The analysis supports the argument that commodity subsidies have a negative impact on small family-farmers, explains why there is a disincentive to chose farming as a career choice for young Americans, and highlights implications of the loss of family farming in the rural communities of the United States and an aging population of farmers. This paper adds to our understanding of how legislators might focus attention on farm policy reform, to encourage family farming and sustain and promote rural development.

Ellie Doom - Public Relations and Lyndsee Elledge - Business Administration
Mentor: Roger Weis
Needline Hygiene Program
Through our partnership with Need Line, we were able to aid the community by collecting hygiene products for people in poverty. We set up collection tables at local pharmacies and passed out lists with specific items Need Line provides to the underprivileged in the Murray-Calloway County area. The Cleaning and Hygiene Program at Need Line helps 248 families per month so there is a great need for hygiene products. Through our project, we were able to collect an overflowing shopping cart and completely full laundry basket of hygiene products.

Margaret Downing - Nutrition
Mentor: Kathy Timmons
The Acceptability of Three Antioxidant Rich Chocolate Bars as a Candy Bar Alternative
The purpose of this experiment is to create three different antioxidant rich chocolate bars as an alternative to a candy bar and test the acceptability.

Dominique Duarte - Music
Mentor: Sonya Baker
The Music Major Experience: Examining Perceptions of and Preparedness for the Core Curriculum
Music majors generally have a rigorous curriculum in preparation for careers in performance, business and education. Some of the core collegiate music courses require skills and knowledge that are best learned as early as middle or high school. However, literature, from music college professors and public school music teachers across the United States, implies that music students are entering collegiate music programs with inadequate preparation for the curriculum. This presentation examines students' perceptions of their level of preparation for these core music courses at Murray State University and the University of Tennessee at Knoxville. Freshmen and senior music majors at both schools were given survey questions asking about five major music courses: keyboard or class piano, theory, aural skills or ear training, applied lessons, and ensembles. Also, freshmen and senior music majors from both schools were interviewed to give a more personal account of their music major experience. Furthermore, professional musicians were interviewed to highlight important aspects of their experiences as a music major. The research shows that overall perception of preparation at both schools was average or below average for most of the core music courses. The presenter will discuss the implications of the conclusions and offer suggestions for change to ease the transition from high school to college for music majors.

Kala Dunn - English Literature
Mentor: Kelley Wezner
An Equal Common Person: Slaves and Social Stratification in Euripides's Medea
Scholars frequently view Euripides's play Medea through the lens of gender, considering Medea to be either an empowered female character who challenges cultural expectations or, conversely, to be a suppressed female character who presents an example of Euripides's misogynistic opinions. However, fewer scholars employ the sociopolitical lens to examine the criticism of social stratification which permeates this work, a criticism which is predominantly presented by the two slave characters who dominate the first segment of the play. Through their words and actions, the Nurse and the Tutor challenge the class restrictions inherent in their social system. In a statement which foretells the concept of social mobility, the Nurse's aspiration to live as an equal common person points toward a desire for advancement to a more secure social standing. Both slaves unpunished judgments, evaluations, and criticisms of their masters and of the general social structure suggest thinly-veiled authorial criticism of the social stratification of Euripides's age. In addition to presenting Euripides's commentary on women and their social role, Medea also provides invaluable, though frequently overlooked, insight into Euripides's heavily-criticized political convictions, providing the opportunity for a fresh look into the Greek social structure.

Kala Dunn - English Literature
Mentor: Peter Murphy
The River as God in Mark Twain's Life on the Mississippi
Mark Twain's rejection of religion, of its leaders' teachings and practices, and of the Bible does not mean that he rejected the idea of a powerful single deity. While scholars typically view Twain's relationship with religious matters skeptically due to his frequent reliance on religious satire and, in his later years, his writings denouncing the Bible and organized religion, Twain's letters to the Reverend Joseph Twichell, as well as to Twain's wife Livy, suggest that he believed in God without accepting the religion that traditionally accompanies that belief. Indeed, theistic themes populate much of Twain's work, most notably in Life on the Mississippi. Here, through lengthy and vivid descriptions of the river's powerful, destructive force, Twain metaphorically links God and the river. Anecdotes show the effect of the Mississippi on the characters that come into contact with it and, in this way, strengthen the metaphor. Life on the Mississippi locates Twain's theistic convictions, the existence of which effects the critical reception of Twain's works criticizing religion. The metaphor also provides thematic unification to an otherwise sprawling book. Clearly, Twain's love for the Mississippi River prompted him to use it as a metaphor for the most powerful being imaginable. In turn, the metaphor enabled Twain to exercise his own spirituality while skeptically examining the conventional religious beliefs of the day. A close reading of Twain's memoir through the lens of this metaphor introduces new insights into this important work.

Jenafer Dummitt- Spanish
Mentor(s): Neal Messer and Meg Brown
Passion and Practical Love
Love in Latin American literature and media is often portrayed with much more passion, physical and emotional, than in the United States. This passionate kind of love is featured in Laura Esquivel's novel Como agua para chocolate in the relationship between young lovers Tita and Pedro. Tita also falls in love with an American doctor; however it is less fervent. In the novel, Tita must choose which man she wants to marry: the passionate, handsome Pedro or the calm, gentle Dr. Brown. However, giving Tita the ability to choose is merely an illusion by the author. This presentation explains how Esquivel would never have allowed Tita to choose the doctor because in her mind, love is not valid if there is no passion.

Samantha Erwin - Mathematics and Aron Huckaba - Chemistry/Mathematics
Mentors: Maeve McCarthy and Kate He
***Using Matrix Analysis to Model the Spread of an Invasive Plant,* Alternanthera philoxeroides**
Alternanthera philoxeroides, more commonly known as alligator weed, is an invasive species indigenous to South America. With its rapid invasion of south east United States water ways, understanding the invasiveness of this plant species is both important and imperative. Utilizing experimental growth data obtained over the summer of 2010, matrix analysis is used to model the growth of alligator weed. These matrices are population projection models whose eigenvalues represent the growth rate of alligator weed in its different stages of the life cycle. A high growth rate is a key feature of successful invaders. Residuals were calculated and sensitivity analysis was performed to test the accuracy and importance of the models. The result of this study indicates that in competitive aquatic conditions, which are the most realistic environment for alligator weed to reside in, the earlier life stage plants are the most sensitive to control measures.

Lisa Exner - Nutrition
Mentor: Kathy Timmons
The Acceptability of Yellow Squash as a Partial Fat Replacement in Yellow Cupcakes
Many people are trying to increase the number of vegetables and fruits they consume as well as replacing fats and oil in their diet. Yellow squash meets both of those goals. Utilizing squash as a partial replacement for fat in yellow cupcake results in better nutrition and better health. The purpose of this experiment is to determine the acceptability of yellow squash as a partial fat replacement at the levels of 0%, 25%, 50%, 75% in yellow cupcakes.

Rachel Fielder - Speech-Language Pathology
Mentors: Sharon Hart and Sue Sroda

Effectiveness of Combining Approaches from Speech Pathology and TESOL for Improving Pronunciation in Native Korean Speakers Learning English as a Second Language

Speaking with an accent can cause communication barriers and may create social and professional obstacles. The American Speech-Language Hearing Association considers it appropriate for speech language pathologists (SLPs) to provide elective services to individuals learning English as a second language (ESL). SLPs have specific training and knowledge that make them highly prepared to provide pronunciation services to ESL speakers. However, many SLPs lack experience working with ESL speakers and may not have the specific knowledge or skills necessary to provide the most effective services. In addition, there is a lack of research within speech pathology regarding intervention for ESL speakers. ESL curricula often include courses that teach pronunciation. However, there is limited research regarding pronunciation instruction within the field of Teaching English to Speakers of Other Languages as well. The purpose of this research study was to assess the effectiveness of an intervention plan that combined approaches from speech pathology and TESOL to target pronunciation. Intervention progressed from the articulatory and phonological approaches used in speech pathology to the communicative approach used in TESOL. The participant was a native Korean speaker learning English as a second language. Intervention consisted of 6 one-hour sessions. Intervention targets were selected from sounds that are present in the English language but not in Korean. The two selected intervention targets were those that the participant demonstrated the lowest percentage of correct production (/z/ and ʧ) at pre-intervention. The participant was assessed at pre- and post-intervention using the Arizona Articulation Proficiency Scale, Third Edition and conversational speech samples. Researchers analyzed change in target sound production and change in overall speech intelligibility. The participant demonstrated a positive change in target productions, with slight improvements in untargeted sounds. She did not demonstrate a change in overall intelligibility. Results are intended to assist both SLPs and ESL teachers in providing pronunciation instruction to ESL speakers. While this study supports the effectiveness of an intervention plan that combines approaches from speech pathology and TESOL to target pronunciation, further research is needed.

Julia Freeman - Biology and Andrew Brigham -Physics and Engineering
Mentor: Maeve McCarthy
Survival of the Fittest: An Exploration into Charles Darwin's World
The ability to reproduce and survive to reproductive age is something humans take for granted. Not all species, plant or animal, have that advantage. Through studying several literature sources surrounding Charles Darwin, the famous biologist who first studied and identified survival of the fittest, a better understanding and application of his work can be achieved. In order to be fully understood, the ideas behind survival of the fittest utilize both mathematical models along with traditional biological ideas such as Founder's effect, natural selection, adaptation, and genetic drift within a given population. Mathematically, survival of the fittest can be explained by exploring the mathematical origins of Charles Darwin's early literature and through several derived logistic growth equations. Overall, the use and implantation of such concepts to everyday life is often overlooked by readers outside of the sciences. But in reality it applies to all areas of study beyond just math and science. Future implications of the research yet to be explored or addressed include more evidence based mathematics equations for biological concepts in general, including evolutionary ones, and more recent examples of how Charles Darwin's work can still apply to life today.

Lance Fulks - Sociology
Mentor: Ian Norris
Affective and Cognitive Components of Music Preference in Musicians and Non-Musicians
We measured both general and music-specific Need for Affect (NFA) and Need for Cognition (NFC) in undergraduate musicians and non-musicians, as well as music genre preference. The relationship between general and music-specific NFC was strong in both musicians and non-musicians; however, the relationship between general and music specific NFA was stronger in musicians. Furthermore, music-specific NFC predicted enjoyment of complex music in non-musicians, whereas both music-specific NFC and NFA did in musicians.

Sarah Fuller - Spanish Education
Mentor: Neal Messer
The Mexican Cinderella
Fairy tales are an essential part of a person's childhood and continue to be a source of escape, hope, and wonder even into adulthood. Fairy tales allow their readers to enter an unknown world full of possibilities, magic, and resolution. Cinderella is the most popular fairy tale around the world. It has been translated into many languages and versions which all maintain similarities. Como agua para chocolate by Laura Esquivel shares many of the same characteristics as Cinderella. From a prince charming to fairy godmothers and an evil mother, this novel mirrors many of the characters and elements, such as a happy ending and the use of ashes, from the Cinderella fairy tale. Much like Cinderella, Como agua para chocolate draws readers in emotionally as they enter the world of Tita, a world similar to that experienced by Cinderella, one filled with difficulties and obstacles. By exploring the similarities between the fairy tale Cinderella and Como agua para chocolate, one can conclude that the latter does in fact possess fairy-tale like qualities.

Ginny Furches - Spanish
Mentors: Leon Bodevin and Warren Edmisnter
When, Why and How to Begin Second Language Education
Using the fundamental questions of language acquisition as a starting point, this research project supports the need to begin to teach a second language earlier in a child's life. Pulling largely from Krashen's Monitor Theory, the natural approach, and the cognitive theory I examine the way humans begin to learn a language and then see how this can be applied to teaching a second language (in this case Spanish). I analyze the current foreign language programs in place here in the United States, such as FLEX, FLES, and immersion programs, as well as examine the second language education practices of other countries to demonstrate what the United States can learn from their example. With this information I propose a possible unit plan that teachers could begin to implement to teach Spanish to children in an elementary school setting. With all the benefits of beginning a second language at an earlier age outlined, my goal is to show that by implementing this proposed unit plan the children will begin to obtain a larger amount of fluency and understanding of Spanish a language that continues to grow in the United States and around the world.

Katie Gaines - Political Science
Mentor: Ann Beck
Motivational Learning: The Impact of Intrinsic Motivation on Student Learning
Public school systems and the education of students is an important public policy issue. Successful teachers are evaluated by annual standardized tests, evaluation tests given at the beginning and end of the year to calculate growth, and through comprehension of materials. When elementary educators use intrinsic motivation, their students will receive higher test scores than peers who have been motivated through extrinsic factors. Secondary analysis of scholarly work relating to the impact of recognition and reward motivation is evaluated. Scholarly work includes but is not limited to *Motivating Students to Learn: An American Dilemma* by Arthur G. Powell and *Beyond Stickers and Popcorn Parties* by Judith Vander Wilt. Both of these scholars discuss the positive and negative outcomes of incentive plans. Also provided is an outline on how to perform an empirical research study to test the hypothesis.

Morgan Geile - Conservation Biology and Jessica Whitaker - Pre-Pharmacy
Mentors: Renee Fister and Howard Whiteman
From Field to Lab: An Overview of Salamander Population Studies and Genetic Analysis
One way organisms adapt to their environment is through phenotypic plasticity. To explore the costs and benefits of such plasticity, we examined facultative paedomorphosis in salamanders, in which individuals exhibit one of two distinct adult morphs as a result of environmental and genetic cues. Facultative paedomorphosis is found in *Ambystoma tigrinum nebulosum* (tiger salamanders) and *Ambystoma talpoideum* (mole salamanders), the study species of this project. Both metamorphic (terrestrial) and paedomorphic (gilled/aquatic) adult forms of these species are found at our study areas: Mexican Cut, CO and Land Between the Lakes, KY, respectively. To better understand the fitness consequences to each alternative morphology, tissue samples were collected in the field and taken back to the lab for genetic analysis. Our lab work was designed to optimize primers for use with microsatellite markers that will aid in assigning parentage to individual salamanders, and eventually help us construct a pedigree. This will allow a way to examine the fitness costs and benefits of paedomorphosis. In optimizing 8 different primers, we found that microsatellite loci were polymorphic, producing 2-9 alleles. We are continuing to evaluate the variability of different primers for parentage assignment. The results of this study will be used to better understand both the ecology of these two species, and the evolutionary costs and benefits of phenotypic plasticity.

Morgan Geile – Conservation Biology
Mentor: Josh Adair
Are We Prepared for the Next Pandemic?
The graphic descriptions of the effects of the Spanish Flu in Thomas Mullen's The Last Town on Earth say it all: bustling townships reduced to ghostlike clusters of dwellings, parents dying in their own homes due to lack of medical attention as their neglected children starve, and weary doctors and nurses making fruitless attempts to save those that they can. Accounts such as this, coupled with the recent threats of bird flu and H1N1 outbreaks, should serve as increasingly persistent warnings of the necessity to prepare countermeasures for pandemics. But is our nation really prepared? Through an examination of current emergency response protocol and modern medical procedures, it is determined that unless changes are made, and the public made more aware, the next pandemic could be catastrophic to not only the nation, but to the entire world.

Shelby Goodlad - Education
Mentor: Meagan Musselman
Does Book Design Really Matter?
Upon completion of Children's Literature (ELE 305), in Fall 2009, I learned that children's book authors format their books in specific ways in order to make them more appealing to their readers. To develop my knowledge of this subject further, I researched why children, at three separate age levels (3-4, 5-6, and 7-8), choose specific books. First, I completed a review of literature regarding the psychological aspects of choice as well as the design and format of children's books including the illustrations, the text, the length of the book, and the topic. This review of literature also included any research that has previously been done on the topic at hand. Next, I laid out, in detail, the methodology of my experiment to explain the children's role in my research. The children's books used for this experiment provided a wide variety of differences among what I am researching so that the children's choices supported whether or not the author's format of their books makes a difference in their appeal to children. I observed a group of students at each level. These students were provided with 68 books with varying text and illustration formats, lengths, and topics. Observations were recorded using anecdotal records in order to obtain an unbiased perspective and the student opinions of the books. From this information, I drew my conclusions of each group and how student perspective of book design changed with regards to age.

Gavin Hale - Geosciences
Mentor: Robin Zhang
Historical and Cultural Implications of LBL Cemeteries in Lyon County, Kentucky
In an effort to gain chronological information regarding trends of cultural structure in relation to the landscape across the county, Paul S. Worboys, a graduate student at Murray State University, conducted a study in 1973 on Calloway County cemeteries. Specifically, Worboys sought to determine the factors that influenced cemetery growth and development. For example, he considered the location of cemeteries and looked for patterns of population concentrations, churches and schools. He found that prior to 1900, cemeteries commonly related to isolation based on family strength, restricted mobility and tightly knit social affiliations. After 1900, agricultural activity and modern mobility brought together greater segments of the population. He noted that complex business and social interests reduced the custom of burying the dead near the homeplace. Since 1940, widespread cultural involvement dissolved the last remnants of isolation and the large, centrally located cemetery became prevalent in Calloway County. In 1965, over 50 percent of all recent burials were being interred within only seven large cemeteries. Worboys noted the trend in burial practices had turned from the privacy of a small family plot or a neighborhood graveyard to the needs of large and dynamic segments of the population. The current project is an attempt to replicate Worboys's research using data from cemeteries within the Land Between The Lakes National Recreation Area (LBL). The intention is to utilize a Geographic Information System (GIS) to focus on the four primary phases already defined by Worboys. GIS can be used to determine the location of every known cemetery within LBL. Individual cemetery data was put into a geodatabase structure. Spatial analysis and cartographic techniques were incorporated to develop illustrative reference material. The end result is a chronological framework in which to discuss cemetery patterns.

Matthew Hall - History
Mentor: Reika Ebert
Nationalism, Anarchism, and Identity
Identity is an important issue in the social sciences today. In this research, I examine the intersection between political and national identity. In particular, I evaluate the intersection between the anarchism and nationalism. I examine a group of German anarchists in the Spanish Civil War and Revolution and use this group as a case study of these cross-cutting identities. The paper builds on my previous historical research on this particular group, with the addition of new material dealing with nation, class, and anarchist theory.

Hannah Hamilton - Advertising, Candace Nevels - Organizational Communication and Torree Rogers - Undeclared
Mentor: Roger Weis
Big Brother/ Big Sister Student Recruitment Event
Our group organized a recruiting event for Big Brothers Big Sisters. This event was at Curris Center and provided information to students that were interested in being a mentor for children in the BBBS program. Facebook was used as a way to advertise our event, which was very effective. At our event, students were able to learn more about Big Brothers Big Sisters and we actually had 47 students apply to be partnered with a child. The competencies focused on were: personal/social; citizenship; cognitive/creative; youth.

Katherine Hartley and Megan Colson - Nutrition
Mentor: Kathy Timmons
Acceptability of Stevia and Fruit Puree as Partial Sugar and Fat Subsitution in Chocolate Chip Cookies
In this experiment, there will be fat and sugar substitutions made to a regular chocolate chip cookie. The purpose of this substitution is to lower the high sugar and fat content of a regular chocolate chip cookie and to raise the healthy benefits using Stevia and fruit puree in place of the sugar and butter and to see if these are acceptable alternatives to a regular chocolate chip cookie. The effects and composition of Stevia will be explained in great detail, since it is relatively new to the market. There will be three samples to taste. The first sample will have all of the sugar substituted with Stevia. The second sample will have 75% fruit puree as the fat substitution in chocolate chip cookies. The third sample will have both the sugar and fat substituted with Stevia and fruit puree. These samples will be compared to an unknown, controlled chocolate chip cookie made with regular butter and sugar to taste the acceptability of the substitutions made to the other cookie samples. Descriptive score cards will be made for panelists to fill out-this will verify their acceptability of taste and other aspects of the cookies.

Jennifer Hayden - Economics
Mentor: David Eaton
Behavioral Finance and Modern Portfolio Theory
In this project, I will take a look at the influence that behavioral finance places on Markowitz's Modern Portfolio Theory. This will be demonstrated by somewhat of a case study, which will be presented, showing the performance of some of today's top companies in a stock portfolio.

Jameson Hill – Liberal Arts
Mentor: Barbara Cobb
Recruitment and Retention of Volunteers; What Nonprofit Organizations Need to Know
This presentation discusses a comprehensive literature review on existing research on the subject of the recruitment and retention of volunteers. It is geared toward nonprofit organizations. It includes a sociological analysis of the importance of volunteer work in American society. Finally, a discussion about recruiting and retaining volunteers using alienation and exchange theory is included.

Morgan Hillard - History
Mentor: Kelley Wezner
Embracing the Unknown
The story of Frankenstein addresses many problems with humanity. One prominent problem seen throughout the piece is the fear of the unknown. The creature is one way in which Mary Shelley captured the idea of the unknown and brings it to the forefront of the mind. She shows how people not only fear what they do not know, but also how many fear change. The creature is feared by everyone including his own creator Victor. However, when Shelley wrote the story in 1818, the world was changing and coming into a new age. England was moving from a predominately rural country to being a major industrial power. The creature can be seen as the industrial age to common English people. The industrial age used techniques and processes that many believed were unnatural and un-Godly. Victor employs the same approach to creating new life. This theme is important in the study of human progression. In the revision of Shelley's idea, The Rocky Horror Picture Show uses the same techniques in which to display the fear of homosexuality. Both pieces push social boundaries to bring about change to the current situation.

Robin Holland - Pre-Vet Medicine
Mentors: Everett Weber and Edmund Zimmerer

Pedigree Analysis to Determine the Mode of Inheritance of White Markings in the Norwegian Fjord Horse

Many breeds of horses have common white markings on their head or lower legs. Such areas of depigmentation are predisposing factors for ailments, including squamous cell carcinoma, equine pastern dermatitis, and photosensitization. Previous studies concluded white markings have a multifactorial mode of inheritance; however, the studies were conducted on breeds that permit crossbreeding. Our study used a breed that strictly prohibits crossbreeding, the Norwegian Fjord Horse. The Fjord is a breed in which white markings are highly discouraged, resulting in underreporting and selection against horses with white markings. The Fjord Horse community also believes that white markings are a recessive trait, affecting breeding decisions. Through pedigree analysis of survey data, we have eliminated the possibility of simple dominance as a mode of inheritance. In addition, preliminary data suggest that the inheritance is not simple recessive either. We do not currently have enough data to negate or support the multifactorial or incomplete penetrance inheritance patterns. Our pedigree analysis also indicates that breeders select against white markings in stallions but not mares. Combined with the variable expression of this trait, this form of selection is not likely to successfully remove the white marking trait from the Fjord Horse population. Further research includes expanding our database to include tests for the KIT gene, which has been shown in other horse breeds to be responsible for white markings. Horse breeders can use our research on the mode of inheritance to make informed breeding decisions and thereby remove this potentially harmful trait from the Fjord Horse population.

Samuel Hook - Creative Writing
Mentor: Kelley Wezner
The Existential Forge and Frankenstein
The focus of this essay is upon the philosophical works of Hegel, Levinas, and Camus and how these philosophies relate to the characters of Victor Frankenstein and his creation. In this essay I argue points concerning the shifting Master/Slave dichotomy that exists in the relationship of Victor and the Creature, and how both characters must reach a point of recognition. Through each other and their external conflict they will both reach a point of self awareness, in which they can understand themselves through their predetermined identities as creator and creation, it is this external conflict that is the catalyst for the internal struggle which exposes the world to be innately meaningless. It is at this point they can accept responsibility for their actions and begin to forge personal meaning. For Victor, this is a process that spans the time between the abortion of the Creature's mate and the fateful meeting with the Creature that ensues, upon which time Victor is no longer a victim of fate but rather the champion of his own self-destructive destiny. For the Creature, this is a process that begins in the choice to find his creator whom abandoned him and ends with the death of his creator, upon which time the Creature can fully realize the absurdity of existence and decides to commit suicide.

Joshua Charles Hyatt - Mathematics
Mentor: Rob Donnelly
Distributivity and Modularity from the structure of the Poset of Irreducibles
The "poset of irreducibles" was developed by George Markowsky as a method of compressing a combinatorial object called a "lattice" into a (usually) smaller "bipartite poset". This talk features further connections between certain combinatorial properties of lattices and certain combinatorial properties of their corresponding posets of irreducibles. In particular, we see how the distributive and modular lattice properties relate to the presence/absence of certain sub-structures in the posets of irreducibles. Showcasing one particular theorem and displaying many colorful and complex graphs, this talk seeks to convey abstract mathematical objects as something beautiful. In addition the showcasing theorem will be of interest to those who have studied mathematics more intensely. We believe these connections together with the graphical nature of posets and lattices are further evidence that this poset of irreducibles is a fundamental object of interest.

Rachael Isom - English Literature
Mentor: Kelley Wezner
Patroness as Pupil: Educational Exchange in Jane Austen's Emma
Jane Austen's Emma tells the story of a gentlewoman whose social privilege and cleverness set her apart from other young women. However, it is also the story of relationships, particularly Emma's friendship with Harriet Smith. This companionship supplies the majority of the plot and provides crucial insight into Emma's character. Austen's early contrast of the two friends provides a powerful incentive to discover how Emma and Harriet interact and how that friendship propels the novel. Many critics seek to explain the Emma-Harriet relationship's nature and function, rendering distinct and often contradictory conclusions about how Emma uses Harriet and what their relationship contributes to a reading of Emma. However, the relationship between Emma Woodhouse and Harriet Smith is not homosexual, is not a mere psychological outlet for Emma, does not represent an adjusted application of masculine-feminine domination, and cannot be explained by a simple one-way teacher-student model. The friendship is a situation in which two effective teachers interact and share experiences that function as a mutual teaching exchange. Harriet provides Emma with a medium to work out her mistakes and experiences that subtly shape her into a worthy wife, but the companion also plays an active role in Emma's maturation and eventual association with Mr. Knightley. Emma's lessons learned facilitate her maturation of character and duty and lead to a conclusion in which she attains the only marital contract that can provide both intellectual stimulation and social advancement.

Charles James - Political Science
Mentor: Ann Beck
Expanded Gaming in Kentucky, the Runaway Train
While Steve Beshear was campaigning for Governor of Kentucky, he wanted to bring expanded gaming to the state to increase tax revenue. The gaming industry is competitive, and states that border each other vie for patronage by expanding the casinos and the loosening of gaming regulations. Once established, casino owners may acquire a stronghold in the community because people come to depend on them for employment. This, along with state investments that will be in need of return, can give the owners of casinos undue influence over state-elected officials. Analyzing the trends in investments and infrastructure that followed expanded gaming since the inception of gaming in Illinois, Missouri, Indiana, West Virginia, and Mississippi will provide insight into associated problems that the Commonwealth of Kentucky might experience with expanded gaming. Once expanded gaming becomes policy in Kentucky, it may be extremely difficult to remove.

John Janacek and Mike Brawner - Nutrition
Mentor: Kathy Timmons
Effects of Pomegranate Molasses Substitute on Ginger Cookies
We are doing this to test the acceptability of ginger bread cookies with pomegranate molasses as a substitute in 25%, 50%, and 100% measurements. The acceptability is being tested because of the health benefits pomegranates have as anti-carcinogens and anti-oxidants. We will be testing for the texture (outer/inner), smell, taste, mouth feel, and overall acceptability. We will also be doing objective testing using the wet ability test.

Dan Jenkins - Geosciences
Mentor: Robin Zhang
Using GIS To Find Clusters of High and Low Mean ACT Scores for Kentucky Counties
This project involves using Geographic Information Systems (GIS) to identify spatially distributed clusters of low and high ACT mean composite scores for all 120 counties in Kentucky. The data also test eight explanatory variables for possible correlation and explanation of the any spatial clustering discovered. The data ranged temporally as a five year trend from 1999 to 2003. The data was obtained from the Kentucky Department of Education in Frankfort, Ky. The five years of ACT composite scores were averaged into a five year mean composite score. This mean average is the dependant variable used in the statistical analysis using ArcGIS 9.3. Independent variables used in the project were: Median income, Percent urban, Percent Rural, Percent Farm, percent Married, Percent Male - no wife, Percent Female - no husband and Percent single. The percent rural, urban and farm are the percentage of the 100% total population of each county. The percent married, percent male – no wife, percent female – no husband, and the percent single, are all the percentage the 100% total population for each county respectively. The analysis includes Hot Spot cluster analysis, Geo-weighted Regression Analysis, and Ordinary Least Squares regression.

Erin Keeney - Wildlife Biology and Callie Wilson - Biology Secondary Education
Mentors: Terry Derting and Renee Fister

Adaptive Immunity Is Not Energetically Costly

The immune system is critical to survival and subsequent reproductive success of organisms. Many researchers have suggested that some components of the immune system, especially adaptive immunity, are energetically expensive. Our goal was to quantify the cost of the immune system to determine whether trade-offs in energy use occur between branches of the immune system and between the immune system and other physiological processes during an immune response. We tested the null hypothesis that an ongoing humoral immune response has no effect on the development of a cell-mediated immune response. Using adult male old-field mice, Peromyscus polionotus, cell-mediated responses were induced in cell-mediated/humoral (CH; n=10) and cell-mediated (Cm; n=10) adult male mice using dinitrofluorobenzene . A humoral response was induced using sheep red blood cells. Results were compared with a control group (Ct; n=10). We measured the energetic cost and strength of the immune responses through analysis of daily metabolic rate, resting metabolic rate, red and white blood cell counts, pinnae measurements, and hemagglutination assays. Metabolic rates of the CH and Cm mice did not differ significantly from those of Ct mice, despite significantly smaller masses of immune and vital organs in the latter group. In addition, we failed to find any significant difference between the Cm and CH groups in any measured parameter. Thus, our work showed no significant trade-offs between the humoral and cell-mediated immune systems. Importantly, our results also did not support the widely-used assumption of a high energetic cost of adaptive immunity.

Erin Keeney - Wildlife Biology and Meredith Stevenson - Applied Mathematics
Mentor: Maeve McCarthy

Wrights F-statistics in Genetic Differentiation

Wrights F-statistics were developed in 1921 when American geneticist Dr. Sewall Wright defined what is now called the fixation index in order to measure the inbreeding effect. This index, which is a prominent feature of modern population genetics, is used to measure genetic variation among subsets of a population by quantifying the reduction in heterozygosity expected with random mating at a given level as compared to a broader level (i.e. individual to subpopulation). Wrights fixation index is predominately used in calculating the average degree of inbreeding within population subsets and uses the Hardy-Weinberg Equilibrium equation to determine expected heterozygosity where p and q represent the A and a allele frequencies, respectively. For our project we have worked with a population data set and calculated the F-statistics for the population to determine the level of inbreeding. Conclusions are drawn about the fixation index and what this means for the future of the population.

James Kendall - Political Science
Mentor: Reika Ebert
Political Identity and Religion
This paper explores how religion affects political behavior such as voting and partisan identity and political ideology. It uses studies from a variety of social science scholars to evaluate under what conditions people of various religious orientations and practices engage in voting behavior, whether they tend to identify with a particular party, and whether they tend to have conservative, moderate, or more liberal positions on social and economic policies. The paper argues that religion does account for some part of people's behavior, especially for certain denominations; however, it cannot totally predict behavior because of other cross-cutting cleavages.

Kyle Kineman - French and English
Mentor: Theresa Saint-Paul
Goodbye, Innocence: Children in French Film
French culture has often held a standard for French children to abandon their childhood very early in order to become young adults who can contribute fully to the society as a whole. However, not all of these children can fit into the conventional mold and conform to the world that has been created for them, with some resisting the entire process. The idea of retaining childhood by resisting the societal norms has been evidenced in several French films from Clement's Les Jeux Interdits to, more recently, Cantet's La Classe. A few select films are closely examined within this study to see how children cope with being forced to mature quickly, some choosing to rebel against societal pressures altogether.

Brian Kinnaman - International Business
Mentor: Reika Ebert
Berlin: a Nation's New Voice
After the Third Reich, the Cold War, and the reunification of 1989, the German people were struggling to define themselves anew and move forward. After the opening of the Wall, Germany’s new capital had the unique opportunity to design a city that would represent the German peoples identity. Using the article “The Nation as Invented Tradition” by Eric Hobsbawn as a point of reference, this presentation focuses on three sites in Berlin - Potsdamer Platz, the Reichstag and the Holocaust Memorial. It explores how these architectural projects function as symbols in the process of unification. These structures represent national business, political and historical identity and were developed within an intense national dialogue over style, location, national origin of the architect, and the materials to be used as an expression of the new unique German voice.

Jennifer Kissiar - Secondary English Education
Mentor: Kelley Wezner
Dissociative Identity Disorder in Frankenstein
In this research paper, I will present a "re-reading" of Mary Shelley's Frankenstein that sheds light on the author's view of the multiple roles she fulfilled as a female writer during the early 19th century. Until now, most readers have taken Frankenstein for what it is on the surface - a troubled man who plays God and goes against nature. Although this reading is enjoyable, I am proposing a new view of the story that focuses on the unreliability of the narrator(s) and the mental condition of Victor Frankenstein. I believe it is plausible (and useful) to read the story with the mindset that "the creature" was actually a creation of Victor's imagination; a doppelganger; a product of associative identity disorder. This new approach to reading a classical story provides the reader with the opportunity for new literary interpretations and, I will argue, is firmly supported by the text. After establishing support for this "re-reading" by examining the layers of narrative in the story, I will apply techniques gleaned from Psychoanalytic Criticism approaches to shed light on the mental condition of Shelley's protagonist, Victor Frankenstein. Furthermore, I will use these techniques to connect this condition to the author herself in relation to the multiple roles she played as a female writer, wife and daughter of writers, and mother.

Robert Klope - Psychology
Mentors: Ian Norris and Leslie Furches
When down is good: Head position affects moral attribution to music
In the human mind, abstract ideas such as goodness and morality, and the emotions they entail, are often associated with more stable perceptions of sensory information. Positive feelings are often described as warm, pure, light, and feeling up, whereas Negative feelings are often said to be heavy, cold, or feeling down. Recent research has shown that these sensory associations can be manipulated to bias interpretations of abstract ideas. This study examined the idea that embodied cognition associated with head position might influence judgments of moral goodness. Participants who were asked to listen to a short musical piece in a head-down position were significantly more likely to rate the piece as more morally good than were participants in either the heads-up or control groups. These findings support the idea that moral judgments are strongly influenced by intuitive processes.

Krystyn Koch - Psychology
Mentor: William Zingrone
Community Prevalence: Stigma Towards the Mentally Ill in Rural Communities
Subjects from Western KY and closely surrounding areas were gathered via the use of an internet based survey to assess attitudes toward the mentally ill. Items from the Perceived Stigma Questionnaire were paired with items developed by the researcher for the purposes of this study aimed at investigating societal attitudes towards individuals who may have been diagnosed with a mental illness or who have utilized the mental health system. General ideas ("people in my community would believe") as well as personal/interpersonal vignettes comparing different diagnoses (Clinical Depression, Bipolar Disorder, and Schizophrenia) were used to examine dimensions of potential stigma.

Amy Krzton-Presson - Biolody
Mentor: Howard Whiteman
Effects of Common Reed Management on Reptile and Amphibian Populations in Clear Creek Wildlife Management Area
The common reed (*Phragmites australis*) is invading fresh and salt water habitats across the United States. Management of this plant often involves herbicides, and its removal has the potential to affect aquatic communities. This project examined the effects of the chemical treatment of Phragmites on herpetofauna in Clear Creek Wildlife Management Area, KY by utilizing one experimental (treated Phragmites) and two control areas (Phragmites control, non-Phragmites control). Turtles were trapped, marked, and measured to gather data on diversity, demography, and movements between experimental and control areas. Frog calls were recorded using automated recording devices to assess diversity. Turtle diversity was significantly lower in the non-Phragmites control treatment than both the experimental and Phragmites control treatment. Turtle body sizes were significantly smaller in both the experimental and Phragmites control treatment as compared to the non-Phragmites control, perhaps because larger turtles are selecting a habitat not invaded by Phragmites. No significance difference in frog diversity was found between sites. This research will provide a better understanding of invasive plant management and its effects on reptiles and amphibians as community members in aquatic ecosystems.

Joshua W. Lambert – Mathematics and Statistics
Mentor: Howard Whiteman
Better Estimating Biodiversity using Zero-Inflated Distributions
In this presentation a better estimate for biodiversity using zero-inflated distributions based on the framework by Royle (2005) and Wenger and Freeman (2008) will be discussed. An improvement on Wenger and Freeman's model by estimating presence and detection by Bayesian logistic regression and modeling abundance with zero-inflated negative binomial regression, and the use of Gelman (2008) work with prior distributions for Bayesian logistic regression in order to achieve better estimates for presence and detection than via maximum likelihood.

Ryan Lantrip - Liberal Arts
Mentors: Lillian Daughaday, Bob Long, and Barbara Cobb
Organizational Assessment of Social Service Agencies of Murray, KY, with a Focus Needs Assessment and Program Evaluation
The research examines the practice of needs assessment and program evaluation in agencies serving the homeless and food insecure. Agencies of Murray, Kenucky, are assessed through an interview and organizational assessment worksheet designed to determine the agencies' needs, finances, needs assessment and program evaluation practices, and how their staff is constructed.

Lacey Latimer - Nutrition
Mentor: Kathy Timmons
The Acceptability of Avocado as a Partial Substitute for Milk in Creamy Tomato Soup
Lycopene is a carotenoid that functions as an antioxidant in the body. Lycopene inhibits the growth and production of cancer cells while possessing free radicals that aid in the prevention of cell damage in fighting against disease. Lycopene consumption has been correlated to lower risks of certain types of cancer and cardiovascular disease. Saturated fats such as those found in milk increase LDL cholesterol while monounsaturated fats found in avocado decrease LDL cholesterol. A ratio of low HDL cholesterol to high LDL cholesterol is associated with a higher incidence of cardiovascular disease. Research indicates that lycopene absorption is increased in the presence of monounsaturated fatty acids. Avocados rich in monounsaturated fatty acids combined with tomatoes rich in lycopene may decrease the risk of cardiovascular disease and certain types of cancer when ingested together. The purpose of this study was to determine the acceptability of partially substituting avocado for milk in creamy tomato soup. Small taste panels performed sensory evaluations on color, texture, flavor, and thickness to determine the acceptability of varying levels of avocado in creamy tomato soup.

Aaron Lattin - Geoscience
Mentor: Robin Zhang
Crime "Hotspot" Analysis of Grand Rapid, Michigan
Today crime science has grown rapidly through the continuous development of hardware and software. In previous crime research, software such as ArcGIS was used to effectively map locations of crime. Mapping of these locations have proven useful in coordinating efforts to curb violent crimes. This study will investigate the theory that certain types of crime is correlated to an average time it is likely to occur. For example, research has shown that assault is likely to occur in the morning hours from 1 a.m. to 3 a.m. To develop a noticeable spatial relationship between crimes one has to gather enough data. The data gathered for this project was from CrimeMapper.com over a three month time-span for Grand Rapids, Michigan. Crimes chosen for this research needed to be plentiful so burglary, assault, and theft were selected. Once the data was formatted, ArcGIS was used to geocode the street address for each crime. Using these points we could then use analysis techniques in ArcGIS software to produce a visual map of hotspot activity. Furthermore, by including the time when the crime was committed we can analyze where and when that particular crime is likely to occur. Maps can then be distributed by the city to better direct police forces to patrol those areas.

Dennie Roger Leach - Political Science
Mentor: Ann Beck

Case Study: Lithuanian Seimas and the Open-List Electoral Connection

One of the continuing questions among scholars of government is how the design of various institutional arrangements affects the behavior and outcomes of those institutions. In particular, in democratic governments, the impact of institutional design is of great interest. Scholars have wondered how differently instituted practices in selection of legislative members might affect legislative behavior. This research is a case-study of member of parliament (MP) behavior in the Lithuanian Seimas (parliament). About half of the members of this body are selected through a national, proportional representation election system and the other half through a district type electoral method where members are elected by a majority vote of first past the post. In the single-member district, voters in a local district cast a ballot for the preferred candidate from a variety of political parties. In a proportional representational system, the remaining MPs are chosen through a nationwide election that distributes membership to the parliamentary body based on the proportion of votes each of the partys earned in the national election. In the latter, voters are voting only for a party. However, in Lithuania, the electoral mode is different. The members on the list in Scotland, Wales, and Germany are chosen by the party, therefore, scholars have suggested that party reputation is more important than cultivating a personal reputation for list members and to be on the list party leadership is also important. In Lithuania and other mixed electoral systems such as Bavaria, the open list is divided up regionally and voters rank (Lithuania) or choose a member from the list (Bavaria). Using theories of how election systems shape legislative behavior, the research hypothesis is that members of the Lithuanian Seimas, regardless of electoral method, tend to perform the same amount of committee service and constituency service. The observation of other scholars has been to the contrary in closed list systems. However, the institutional change in Lithuania of an open list system may be able to explain why the relationship found in other countries by other scholars has not been found in Lithuanian Parliamentary Affairs. Using the observations of other scholars, this research provides comparative data and analysis on how Lithuanian MP behavior is similar and deviates from the behavior of other MPs in Germany, Wales, and Scotland. The study uses statistical methods such as difference of means and regression analysis to compare Lithuanian members of parliament behavior on committee service compared to the findings on MPs behavior in the dual selection systems of Germany, Wales, and Scotland. The study supports previous scholarship and adds to the knowledge of mixed electoral systems by finding that when institutional changes are made significant relationships may no longer be observed. The research adds to our understanding by applying existing theories to new democracies and demonstrating that the theory may not hold true for both new and established democratic parliamentary systems if changes are made to the various institutions.

Katie LeBlanc - Agronomy
Mentor: Iin P. Handayani
Soil Quality Responses to Land Management Uses

To ensure the quality of our soil, we must take notice of the land management practices enacted upon the land over time. Modification of farming practices from conventional tillage to no till and organic based farming practices may change soil quality indicators. Soil characteristics such as soil organic matter (SOM), water holding capacity (WHC), bulk density (BD), total porosity, and aggregate stability (AS) are considered vital soil quality indicators. This study has analyzed the effects of farming practices on soil characteristics. Soil samples were collected from the Murray State University farm in Calloway County, Kentucky. In August 2010, surface soil (0-7.5 cm and 7.5-15 cm) were taken collected from five fields: (1) sod as a control field, (2) 3 years of organic farm (OF3), 5 years of organic farm (OF5), (4) 15 years of no-tillage systems (NT), and 15 years of conventional tillage (CT) systems. The results show that organic farming and no tillage practices improved SOM, BD, porosity and AS. The highest values of these properties were found in 5-yr organic farming and the lowest were in 15-yr conventional tillage systems at the depth of 0 to 15 cm. Soil compaction, as indicated by bulk density, reduced up to 15% and the ability of soil to hold water increased about 22% after 5 years of organic farming when comparing to 15-yr of conventional tillage farming practices. Better soil quality under organic farming and no till practices indicates that organic matter input can improve soil properties and regenerate degraded lands.

Katie LeBlanc – Agronomy
Mentor: Iin P. Handayani
Assessing Land Management Quality Using Soil Physical Properties

Monitoring the changes of soil characteristics is important to better manage our farm, as well as to protect our natural resources. Modification of farming systems from conventional tillage to no till and organic based farming practices may change soil quality indicators. Soil characteristics such as soil organic matter (SOM), water holding capacity (WHC), bulk density (BD), total porosity, and aggregate stability (AS) are considered vital soil quality indicators. This study was designed to determine the effects of farming practices on soil physical characteristics. Soil samples were collected from the Murray State University farm in Calloway County, Kentucky. In August 2010, surface soil (0-7.5 cm and 7.5-15 cm) were taken collected from five fields: (1) sod as a control field, (2) 3 years of organic farm (OF3), 5 years of organic farm (OF5), (4) 15 years of no-tillage systems (NT), and 15 years of conventional tillage (CT) systems. The results show that organic farming and no tillage practices resulted in improving SOM, BD, porosity and AS. The highest values of these properties were found in 5-yr organic farming and the lowest were in 15-yr conventional tillage systems at the depth of 0 to 15 cm. Soil compaction, as indicated by bulk density, reduced up to 15% and the ability of soil to hold water increased about 22% after 5 years of organic farming when comparing to 15-yr of conventional tillage farming practices.

Todd Levine – Biology
Mentor: Howard Whiteman
Shell Structure and Burrowing Behaviors in Freshwater Mussels
Movement is an important trait that is critical for the survival of many animals. Because of their sedentary lifestyle, studies examining the movement capabilities of freshwater mussels are relatively limited. However, the ability to move and burrow into the substrate and, conversely, the capacity to resist dislodgement despite hydrologic forces and attempts by predators to remove them are likely crucial components of their behavior. Performance of such behaviors is likely to be directly linked to survival and fitness. Likewise, performance of these tasks is likely to be affected by the presence and nature of shell ornamentation which can vary widely within and among species. Studies of marine bivalves suggest that shell ornamentation introduces a tradeoff between their ability to burrow effectively and to remain stationary when an extrinsic force attempts to dislodge them from the substrate once buried. We examined the effect of the presence and size of shell ornamentation on the burrowing performance and force required to dislodge buried mussels by artificially creating shell ornamentation on a relatively smooth-shelled species (*Potamilus alatus)*. Mussels were videotaped in laboratory aquaria to quantify burrowing sequences. Dislodgement force was also measured in these aquaria. Interestingly, in our preliminary analyses, we found that shell ornamentation had no significant effect on any of the burrowing performance measures. However, the presence of artificial ridges significantly increased the force required to dislodge buried mussels. This suggests that varying amounts of shell ornamentation present in mussels help individuals resist dislodgement from the substrate by abiotic or biotic forces without substantial inhibition of burrowing abilities.

Sudan Loganathan - Chemistry
Mentors: Bommanna Loganathan and K. Kannan
Occurrence of Bisphenol A in Indoor Dust Samples from Kentucky and New York and Implications for Human Exposures
Bisphenol A (BPA) is used in the production of polycarbonate plastics and epoxy resins, which are used in many consumer products. Sources of human exposures to BPA include packaged and canned food products, indoor air, and dust ingestion. Information on the relative contributions of the pathways to BPA exposures is limited. In this study, we measured concentrations of BPA in indoor dust samples collected from two locations in the Eastern United States (Kentucky and New York) and evaluated the contribution of dust to total BPA exposures. BPA was found in 95% of the dust samples analyzed (n=56) at concentrations ranging from <0.5 to 10,200 ng/g (mean 843; median 422). The median values for BPA intake by way of ingestion of dust by adults and toddlers were calculated to be 0.35 and 5.63 ng/kg body weight/day. These estimated exposure doses of BPA through dust ingestion are of the same order of magnitude as the recently reported low concentrations that induced health effects in laboratory animal studies. The contribution of dust to total human BPA intake was estimated to be <1%, however, suggesting that dietary intake is the predominant source of exposures in humans.

Sudan Loganathan - Chemistry, Mahamoud Elsayed and Dan Varonin - Biology, and Amber Kelly – Agriculture
Mentor: Alexey Arkov
Characterizing Germline Stem Cell Development Using Drosophila melanogaster
Stem-cell research is an exciting and growing field of biology with numerous possible applications in medicine. Using the fruit fly (Drosophila melanogaster) as a model system, we are studying germline stem cells so that their development may be better understood. Germline stem cells have been called the ultimate stem cells because of their ability to differentiate into any type of cell. By using various genetic and biochemical approaches we are able to classify and characterize protein interactions, localization, and enzymatic activity during oogenesis. Our research revolves around the Tudor protein. This is a large protein that contains eleven individual domains that are responsible for Tudor's various roles during germ cell development. Tudor has been shown to be vital for the formation of the germ cells in Drosophila embryos. By studying Tudor, and its effects on germline development, we hope to build a more advanced understanding of stem cells.

Lucy Love - Liberal Arts
Mentors: Barbara Cobb, David Pizzo and Henry White
Propaganda: An Analysis of the National Socialist Party Method
An analysis on the effectiveness of propaganda techniques as utilized by the National Socialist Party during the World War II era has been performed. This analysis focuses on the ability to identify propaganda techniques and the effectiveness of propaganda techniques within political and social constraints.

Emily Lowery and Ali Shecraft - Nutrition
Mentor: Kathy Timmons
The Acceptability of Chocolate Chip Cookies Prepared Using Pureed Pear, Peach, or Kiwi as a Fat Ingredient Substitutes
The purpose of this study is to determine the overall acceptability of chocolate chip cookies prepared using pureed pear, peach, or kiwi as a fat replacement for 100% of fat ingredient and to compare their sensory attributes to those cookies made with a traditional type of fat.

Adam Martin - Biology
Mentor: Michael Flinn
Crappie Population Trends in Kentucky and Barkley Lakes
Populations of white crappie, *Pomoxis annularis*, and black crappie, *Pomoxis nigromaculatus*, have traditionally been very healthy in Kentucky and Barkley Lakes. This has attracted thousands of anglers to the region annually. However, crappie populations are typically cyclical with strong year classes every 2 to 4 years, (Mitzner, 1991.) Historically there has been a larger population of *Pomoxis a*. than *Pomoxis n.*, however, more recent surveys have suggested that this trend may be reversing. To monitor these populations and more accurately describe the factors affecting these populations, 25 years of crappie abundance survey data from fall trap netting was analyzed for trends and compared statistically with a 23 year dataset of a large variety of environmental variables collected for Kentucky Lake over the same time period. This ecosystem wide approach is intended to lead to a better understanding of the factors affecting the year class strength and growth patterns of crappie in Kentucky and Barkley Lakes.

Travis Martin, Robert Hughes and Chen (Jamie) Xiaojing – Occupational Safety and Health
Mentor: Tracey Wortham
Ergonomic Analysis of Material Handling in a Warehouse Facility
This study analyzes ergonomic issues at a warehouse in Western Kentucky. Three members of OSH 663, Applied Workplace Ergonomics, visited the site to evaluate potential ergonomic risk factors for musculoskeletal disorders in manual material handling using techniques such as the NIOSH lifting equation, 2D biomechanics, ergonomic checklists, and Liberty Mutuals psychophysical manual material handling tables. An overview of the findings along with recommendations for reducing ergonomic hazards will be presented.

Victoria Martin - Psychology
Mentors: Alysia Ritter and Joel Royalty
The Role of Humor and Personality in Well-being

Well-being reflects life-satisfaction and overall happiness. The humor styles an individual possesses can be instrumental in one's outlook and in evaluating their feelings of well-being. Personality can account for individual differences between people in affect, cognitions, and behavior. It was hypothesized that the use of both adaptive humor styles and positive personality traits would be significantly correlated with well-being. It was also hypothesized that personality traits and humor styles would account for a significant proportion of variance in well-being. One hundred-seventeen college students, mean age 23.03 years, completed a series of questionnaires consisting of Saucier's (1994) Mini-Markers personality scale, Martin et al.'s Humor Styles Questionnaire (2003), and Diener et al.'s Satisfaction with Life scale (1985). The effect of the four humor styles and the big five personality traits on well-being was investigated. Supporting the hypothesis, the two adaptive humor styles were both found to be significantly correlated with well-being: affiliative and self-enhancing, $r(117) = .35$, $p > .001$. Three personality traits were also found to be significantly correlated with well-being: extraversion $r(117)=.26$, $p=.004$, agreeableness $r(117)=.33$, $p>.001$, and conscientiousness $r(117)=.22$ $p=.018$. Using a regression analyses to determine the proportion of variance accounted for in well-being with the variables humor styles and personality traits, it was found that the two accounted for 22% of the variance. $F(1,114)=16.05, p>.001$. Therefore, the hypotheses that positive personality traits and adaptive humor styles tend to predict greater well-being was supported. Although humor is extremely important to well-being, it was shown that only the affiliative and self-enhancing humor styles were predictors of overall happiness.

Hailey McDaniel - Nutrition
Mentor: Kathy Timmons
Acceptability of Red Velvet Cupcakes Prepared with Avocado Additive for Greater Health and Nutritional Benefits

Avocads have been shown to reduce the risk of breast and prostate cancer as well as promote eye and heart health in addition to many other health benefits. This study would like to determine if the addition of avocado to red velvet cupcakes could provide greater nutritional value and health benefits than that of traditional red velvet cupcakes. Avocado will replace the fat in both the cupcake mix and icing. Cupcakes will be evaluated in terms of color, texture, flavor and overall acceptability.

Anna McNeil - Nutrition
Mentor: Kathy Timmons
Acceptability of Macaroni and Cheese Made with Whole Wheat Noodles and Vitamin Enriched Water
Macaroni and cheese made with whole-wheat noodles and vitamin enriched water increases its nutritional value. The purpose of this experiment is to determine if the increase in nutritional value is detectable. If the change is found to be undetectable, it could be implemented to add nutritional value to a traditional favorite.

Joshua Mercer - Mathematics
Mentor: Maeve McCarthy
Modeling a Smallpox Biological Attack as an Epidemic
Treating a biological terrorist attack on United States as a form of an epidemic provides a way to model the spread of a disease, in this case smallpox, through the contact process of infection and transference through airborne contaminants. Rates of infection through contact, exposure, mortality, along with wind patterns and rates and percentages of recovery, all recovered from past outbreaks and data records, will provide data for the most accurate computer model of what to expect. The goal of the modeling process is to effectively predict the location of infected individuals and the rate of disease transmission. By generating a model utilizing a lattice-based contact system coupled with the differential equations of typical SIR and SIS epidemic models, it is possible to more accurately determine the outcome and make predictions for a population that is unevenly distributed and dynamic. By adjusting the model to incorporate a limited supply of inoculations and containment procedures, one can mathematically determine the critical times and locations to employ countermeasures in order to save the largest number of lives and sustain minimal casualties and other damaging affects to national security.

Jared Militelo - Biology
Mentor: Michael Flinn
Movement, Habitat Use, and Diet Selectivity of Re-introduced Juvenile Alligator Gar,* Atractosteus spatula*, in Clarks River, Kentucky
Alligator Gar (*Atractosteus spatula*) populations have been extirpated from many of their widespread native distributions across the United States. This has been the result of habitat loss and exploitation, along with the combination of commercial and sport overfishing. The Kentucky Department of Fish and Wildlife Resources (KDFWR) have made the commitment to restore alligator gar in their native waters within the Commonwealth. In early October 2010, 20 juvenile alligator gar (age - 0, approximately 20-25 inches long) were surgically implanted with acoustic telemetry tags, and subsequently stocked in the Clarks River in northwestern Kentucky. Stationary receivers deployed within the Clarks River, and local stretches of the Tennessee River and Ohio Rivers, have helped maintain a broad scope of fish movement. A mobile receiver has provided much greater detail on short term movement of the gar. In hopes of determining spatial and temporal movements across seasons, gar have been tracked two times a week since January 2011 using the mobile receiver approximately. Initial results show that the alligator gar are utilizing the habitats present in the Clarks River, and that movement of these fish is relatively low. In addition to movement information, the project has studied the alligator gar's dietary preferences, compared across other gar species that inhabit the study area. The findings of this project will provide the KDFWR with data necessary for the successful restoration of this native species, along with additional ecological and economic benefits that coincide with establishing alligator gar within the Clarks River.

Rachel Miller and Jacque Garrard- Public Relations, and Toni Baker- Organizational Communication
Mentor: Roger Weis
Senior Citizen Mental Alertness Activity
Senior Citizen Mental Alertness Activity (SCMAA) is a program developed by students from Murray State University for the residents of Hickory Woods Senior Living Community. SCMAA included a game set up like the popular game show Wheel of Fortune. The students can use what they have learned in their American Humanics class that teaches how to plan and execute a beneficial program. SCMAA format consisted of 2 one-hour programs at Hickory Wood's entertainment room. It consists of two rounds. The first round is a warm up round and the second round is the championship. A large white screen where a projector displays the puzzles is set up while a replica "Wheel of Fortune" wheel is passed around the room as the residents play. Each color is represented to be a particular point amount. Score is kept and the winners are given a prize. All participants receive a prize at the conclusion of the game. Numerous studies have shown that an active mind stays healthier. Mentally stimulating games such as Wheel of Fortune, benefit the residents to help prevent the onset of elderly diseases, such as dementia or Alzheimer's.

Stephanie Miller, Anna Newmaster and Scott Zigrye - Occupational Safety and Health
Mentor: Tracy Wortham
Muscoloskeletal Disorders Developed by Gastroenterologists
We will be observing endoscopic procedures at a Medical Center. The purpose of our study would be to identify risk factors experienced by physicians associated with performing endoscopic procedures. Endoscopic procedures tend to be hand intensive as they involve the use of cameras to examine the gastrointestinal tract. Evaluations will include the use of ergonomic tools and data collection such as: interviewing endoscopists about their tasks and any discomfort resulting from performing endoscopies; taking measurements, such as angles of body positions and distances from equipment or patients; observing the degree of repetition required for using endoscopes; identifying awkward postures; and taking photographs with the subjects' permission. To assess risk factors, ergonomic tools such as RULA, HAL TLV, Strain Index, discomfort surveys, and physical devices will be utilized. Physical devices that will be used in the ergonomic assessment of the procedure will include Pinch dynamometer, goniometer, digital cameras, protractor, tape measure, and a power grip dynamometer.

Jessica Minyard - Creative Writing
Mentor: Squire Babcock and Warren Edminster
The Second Circle
"The Second Circle" is a story I wrote utilizing an unreliable narrator and referencing Dante's "Divine Comedy" as an allegorical representation of the main character's own journey through a self-perpetuated hell. There are several themes that are featured and explored throughout the work, including the ideas of sex and love, punishment, sin, religion, social hierarchies, and the sometimes misguided hunt for truth. To this end, the plot of the story revolves around a Catholic school girl who may or may not have had an indiscriminate sexual encounter with a priest.

Basma Mohamed - Geosciences
Mentor: Robin Zhang
Comparing Urban Sprawl of Atlanta, Georgia and Portland, Oregon, Using Remote Sensing and GIS
It is important to monitoring urban sprawl because of its massive impacts on the environment. The combinations of spatial analysis tools in a GIS (Geographic Information System) with remotely sensed data have been used to measure and monitoring urban sprawl. Comparing the extent of sprawl in different urban areas may provide insight into sustainable land use planning. Atlanta, Georgia is among the fastest growing cities in America, also one of the "sprawl capitals". Portland, Oregon is among the first metropolitan areas to establish an urban growth boundary. This project will compare the growth of developed areas in these two cities for the period of around 1990 to 2000. It is expected to show that the expansion of urban areas is at a faster rate in Atlanta than Portland. The growth of urbanized areas is expected to outpace that of the population growth, more so in Atlanta. The results will also show if the growth boundary set up in Portland effectively combat urban sprawl.

Teris Moodie - Political Science
Mentor: Reika Ebert
Assimilation and Political Participation Among Hispanic Americans
Using secondary resources and data, I analyzed Hispanic assimilation into the United States and its effects on political participation. English language proficiency, adaptations to culture, religion, and representation in the political arena were each addressed in conjunction with political participation. Conclusions expected are that Hispanic immigrants assimilate effectively and quickly and assimilation does affect political participation among this group.

Charles Morgan- Waterscience
Mentors: Robin Zhang and David White
Spatial Interpolation of Water Quality Parameters in Kentucky Lake
Manual water quality measurements have been taken in many bodies of water worldwide, but these measurements can be costly and inefficient. GIS techniques, however, can provide a way to measure a greater area with less effort and resources than manual sampling. While remote sensing has been shown to be effective for an entire lake, with smaller bodies of water, such as Ledbetter embayment, a simple spatial interpolation can be applied to produce acceptable data. There are four sampling sites situated down the length of Ledbetter Bay. These sites should provide an appropriate amount of data to estimate unknown values for an area the size of Ledbetter Bay using spatial interpolation methods. Using Inverse-Distance Weighting would be simple to calculate but there is the chance that there are values which will be less than the range of manually sampled values. Kriging seems to provide the more accurate information over a continuous field, so it will be used to estimate the approximate water quality values in the whole of Ledbetter embayment. It is through these applications that unknown areas can be more easily sampled.

Sarah Moss-Crisp - Economics
Mentor: David Eaton
Are You Ready for an Upgrade?
The cell phone and wireless carrier market is now considered a mature market. I reviewed what economic strategies producers of products in mature markets do to stay competitive. By using available phone and operating data, I then looked at market trends and distribution data for some of the major wireless carriers. A survey was taken about customers relationships with their phone and wireless carrier. Results of the survey and what conclusions can be drawn about how long customers keep their cell phones are discussed and what factors influence customers most when purchasing a cell phone.

Bryce Norris - Mathematics
Mentor: Renee Fister
Montezumas Revenge: Learn Math to Save a Life
Despite ranking sixth in leading causes of death around the world, diarrheal disease goes largely unaddressed by modernized (generally high-income) nations. Cholera is just such a disease. It draws blank stares, yet, has caused significant loss of life in nations across the globe. This research follows a body of work dedicated to investigating the treatment and control of cholera. The exciting aspect of this work is the qualitative implications on outbreaks as recent as those following the earthquake in Haiti.

Amanda Nowak and Jamie Kloenne - Recreation and Leisure Services and Lori Milligan - Special Education
Mentor: Roger Weis
Main Street Youth Center Pancake Breakfast
Our team chose to work with the Main Street Youth Center. For our YNL 350 class, we chose to run a pancake breakfast to raise funds for the center. We made posters, flyers, a PSA, and sent e-mails to organizations on- and off-campus. We received the ticket design from Carrie's intern at the youth center. The tickets were sold for five dollars. Two dollars from every ticket redeemed at the breakfast went back to Applebee's where we hosted the event. Applebees donates the proceeds to the Make a Wish Foundation. The group was responsible for promotion, sales, and working the breakfast. We presold some tickets to friends and family. Also, we sold tickets at the Clark Stock event on October 16. In total, we sold thirty tickets. We were able to raise $167.00 for Main Street Youth Center. Once we arrived at the breakfast, we divided up the hosting, serving, and cleaning. We were joined by some volunteers from the center. The biggest reward from the breakfast was being able to bring more awareness to the needs of the youth center as well as all of the great things it has done for the children in this community.

Kirby O'Donoghue - Agricultural Education, Courtney Billington -Social Work and LaTreze Mushatt - Advertising
Mentor: Roger Weis
Big Brother/Big Sister Halloween Event
Part I: Our group organized a Halloween event for the local Big Brothers/Big Sisters Program in collaboration with Alpha Omicron Pi and Lambda Chi Alpha. There were ten stations that each featured a "fall festival" theme. One special station was "Health Matters" which allowed the youth to interact with the MSU Women's Basketball Team while learning about self-esteem, healthy eating, and physical fitness. The competencies focused on were: personal/social; citizenship; issues; families; children; youth. Part II: Our group organized a Greek-wide recruitment to seek out individuals in fraternities and sororities in becoming a Big Brother or Sister for the BBBS program. A brief presentation occurred at the beginning of Greek meetings, and then the group members connected those interested with Suzy Crook, director, for the application and interview process. The competencies focused on were: personal/social, citizenship, cognitive/creative, and youth.

Ajadi Olaniyi - Geoscience
Mentor: Robin Zhang
A Geospatial Approach to Map and Analyze Crimes in Kentucky Counties
Discovering spatial patterns in crime incidences helps local communities in strategically allocating law enforcement resources. With the advancement of geographic information system (GIS) technology, density maps can show the concentration of crime events, and spatial analysis tools can analyze social economic factors that may contribute to elevated crime incidences in certain area. In this study, the Geographically weighted regression (GWR), which is a form of linear regression model, was used to model the spatial relationship for identifying hot spots of crimes and comparing the distribution of crimes in all counties of Kentucky. The individual crime events were modeled as dependent variables, and the counties' total population and median income were considered as the explanatory variables. It is found that number of crimes is positively related to total population and inversely related to median household income. The counties that have higher or lower than expected crime incidences are also analyzed.

Richard Osban – History and German
Mentor: David Pizzo
German Anti-partisan Warfare on the Eastern Front and its Roots, 1941-1945
In 1941, the German army began its invasion of Russia. The next four years saw some of the most brutal activity of the entire war, namely that of German oppression of partisan "bandits." This project seeks to determine, through an examination of secondary sources and the reports of the German rear units, the source of the increased violence toward partisans on the Eastern front. This is a case study of asymmetrical warfare and the causes of violent surges by invaders.

Richard Osban – History and German
Mentors: Ann Beck and Reika Ebert
Germany and the National Question: Bavarian Identity
For centuries the nation of Bavaria, whose formation and defined borders predated those of Prussia, was a proud and independent state with an important role within the Holy Roman Empire as well as within European affairs as a whole. Following the Franco-Prussian war of 1870, Bavaria was incorporated into the greater German Reich. Did Bavarian nationalism cease altogether? This study seeks to examine the idea of a "German" nationalism by determining whether or not "subnationalisms" exist within Germany, namely by looking at Bavarian cultural identity through the eyes of Bavarians. This study is especially important in a modern setting, wherein the question of multiculturalism in Europe has taken on such important political implications.

Carrie Overton - Liberal Arts
Mentor: Kelley Wezner

The Expectations of Beauty and Experience of the Sublime in Mary Shelley's Frankenstein

Frankenstein's Victor subconsciously gives each character in the novel a measured amount of physical beauty with his own aristocratic family receiving the greatest portion. This designated level of beauty represents each character's class and position in society. In addition, the women's beauty represents their worth in the period's patriarchal society. The Creature's lack of beauty places him furthest away from the upper class, where the ugly becomes marginal and is forced to live at the edge of society. But beyond the boundaries and limitations of beauty and social class, the Creature finds safety in the sublime setting of the Swiss Alps.

Maria Paramo - Spanish Education
Mentor: Leon Bodevin
Higher Education for Illegal Immigrants
The United States is a nation created by immigrants. The first colonizers of America were from many different nationalities and came here for a better life. "The better life" as they called it, included liberty, freedom, and religious freedom but also offered an opportunity for their children to have a better life. This is exactly what we see from today's immigrants too, but now they are called criminals. They bring their children to the United States hoping to give them the education they lack but what they discover is that this is impossible, because the government puts every obstacle they can to stop them from pursuing higher education. The United States Senate and House of Representatives should give an opportunity to the students by passing the DREAM Act. Instead they are trying to take away the citizenship from children who are born to illegal immigrant parents. What will be next?

Zachary Park and James Chamberland - Political Science
Mentor: Ann Beck
The Obama Effect: How President Obama's Registration Efforts Influenced the Election
Obama's victory is historic. In order to get elected, Obama revolutionized American Presidential Campaigns. Using traditional grassroots connections among other useful campaign strategies, they provided him with nearly limitless funds and volunteers. With those resources Obama registered millions of individuals and strengthened the electorate. With this strategy his margin increased substantially in states where he invested countless amounts of resources in and he won states long thought out of the possibility of Democratic Candidates.

Shangwu Peng - Biology
Mentor: Bommanna Loganathan
Carbamazepine Concentrations in Western Kentucky Watershed
Carbamazepine is a drug primarily used in the treatment of attention-deficit hyperactivity dis-order (ADHD), epilepsy and bipolar disorder. Presence of pharmaceuticals in municipal wastewater, stream, and river waters is an increasing problem, likely to have adverse effects on aquatic organisms and our drinking water supply. The objective of this study was to determine the levels of carbamazepine in water samples from Murray's Wastewater Treatment Plant (MWWTP), Bee Creek, Clarks River and Red Duck Creek. The sampling events occurred from October 2010 through March 2011. The samples were analyzed using the Enzyme Linked Immunosorbent Assay (ELISA) method. Measurable levels of carbamazepine were detected in all samples analyzed. Concentrations of carbamazepine ranged from 13.2 ng/L (Site C of Red Duck Creek) to 37.0 ng/L (Effluent). The data exhibited that there was no seasonal differences in concentrations of carbamazepine in the Western Kentucky Watershed. The concentrations were similar in Bee Creek, Clarks River and Red Duck (Range: 13.2-21.2 ng/L). Carbamazepine levels in effluents of WWTP were considerably higher than all other sites.

Tony Piercy - Biology
Mentor: David Canning
A Microsurgical Procedure to Generate Neural Stem Cells
In vertebrates, neural stem cells appear early in embryonic development as the neural plate. The neural plate arises due to cellular interactions between the anterior end of the primitive streak (Hensen's node) and cells of the surrounding epiblast. Hensen's node secretes growth factors, along with other proteins, that instructively induce the epiblast to form neural stem cells. These include Fibroblast growth factors (FGF) and antagonists that counteract ventralizing molecular signals from the posterior primitive streak. FGF serves to direct the movement of the node through posterior regions of the streak. As the node cells proliferate, progenitor cells of the epiblast are displaced from the stem zone to become part of the neural plate and differentiate as neural stem cells. A gradient of Wnt proteins produce dorsalization of the embryonic axis. Expression of Wnt posteriorly is counteracted by inhibitors such as cerberus and frizzled-related proteins expressed at high levels anteriorly. Since the node is responsible for these molecular interactions leading to neural plate formation, we have hypothesized that the ectopic transplantation of the node may lead to the generation of neural stem cells in other areas of the epiblast. Using the early chick embryo as a model system, we have performed experimental transplantations of Hensen's node into lateral regions of the epiblast. Our studies have demonstrated that neural stem cells can be generated ectopically, with the competence of the epiblast being an important factor in the timing of neural stem cell generation.

Hunter Pingston and Langdon Dement - Occupational Safety and Health
Mentor: Tracy Wortham
Ergonomic Assessment of a Refrigerated Dough Processing Factory
This presentation will include an analysis of ergonomic issues at a Refrigerated Dough Processing Factory in Middle Tennessee. Two members of OSH 663 Applied Workplace Ergonomics visited the site to evaluate potential ergonomic risk factors for musculoskeletal disorders in the factory's Icing Room's and Pre-Mix areas using techniques such as the NIOSH Lifting Equation, 2D Biomechanics, Liberty Mutual's psychophysical manual handling tables, Rapid Upper Limb Assessment, Strain Index and ergonomic checklists. An overview of the findings along with recommendations for reducing ergonomic hazards will be presented.

Jonathan Powers - Nutrition
Mentor: Kathy Timmons
Acceptability of Inulin as a Replacement for Oil in Cake and Sugar in Icing
Inulin, a soluble fiber extracted from several different plant sources, can be added to many different types of foods to replace fat and sugar. Experiments have been done to find if inulin replacement in certain foods, such as yogurt, ice cream, and icing, still has an acceptable taste. In this experiment, inulin will be replacing oil in a yellow cake as well as sugar in a homemade icing. Inulin is replacing oil and sugar in varying amounts to see if it is possible to reduce the calories and still produce an acceptable product. Sensory and objective evaluations will be done to determine acceptability and to compare quality characteristics to a control.

Topaz Prawito - Murray High School Student
Mentor(s): Iin Handayani and Mark Coyne
Soil Organic Carbon and Nitrogen associated with Three Tall Fescue Grass Varietie
Tall fescue (*Festuca arundinacea* Schreb.) is the most important cool-season grass in the United States, providing the primary ground cover on 35 million acres of land. It occupies approximately 5.5 million acres in Kentucky, thus it provides as an integral part in Kentucky's agricultural landscape. The benefits of forages on soils have been well documented, but limited information is available on the effects of different varieties of tall fescue on soil properties. The objective of this study was to investigate the impacts of three varieties of tall fescue (*endophyte-infected, endophyte-free and endophyte-MaxP tall fescue*) and a cropped field on the concentration of organic carbon and nitrogen in Grenada soils of western Kentucky. We collected soil samples of 0 to 7.5 cm depth from Murray State University Farm on May 2010. This study demonstrated that the introduction of a species, tall fescue, with various functional traits than the surrounding community alters soil organic matter content. The three tall fescue fields contain different amount of soil organic carbon and nitrogen. On average, all tall fescue forages have potential to accumulate more soil organic carbon and nitrogen compared to an adjacent cropped field. In conclusion, the results indicate that tall fescue forage management strategies are more effective at sequestering carbon and nitrogen than cropping management in silt loam soils.

Grant Price – Political Science
Mentor: Ann Beck
The Use of Power in Organizations by Muted Group Members
This study explores literature concerning three variables: (1) muted group status, (2) expressions of authority, and (3) organizational identity. To further analyze these variables two theories are incorporated: (1) muted group theory and (2) symbolic interaction.

Ryan Prusinski - Geosciences
Mentors: Robin Zhang and Amanda Keen-Zebert
Comparing Land Use/Land Cover Change in Variably Managed Sub-catchments of the Buffalo National River Watershed, Arkansas
Historical and modern aerial photography are being used to analyze the land use/land cover (LULC) practices and changes over a period from 1972-2010. The project area is the upper reaches of the Buffalo River Watershed, located in Newton county, northwest Arkansas. Two portions of the watershed are analyzed, a portion of the Buffalo National River (BNR) that was federally protected with National River status in 1972, and a portion of a large tributary, the Little Buffalo River (LBR) which has retained private ownership. Land designated National Parks have restrictions on intensive land-uses that would otherwise negatively impact the natural environment or scenery. In the BNR federally and state owned lands make up 40% of the watershed, the majority of which is located in a buffer zone surrounding the river. The remaining 60% is privately owned land located on uplands and tributaries such as the LBR. Using aerial photography the LULC in both federally and privately managed sub-catchments of the BNR from 1972-2010 is classified and quantified. LULC changes be seen to wilderness from agriculture, range and urban land uses in federally owned catchments. While in privately owned catchments LULC change will be seen to agriculture, range and urban from wilderness. This research contributes not only to a better understanding of the BNR catchment, but also to understanding the long term effects of National Park designation on LULC change.

Sabrina Prusinski - Liberal Arts
Mentors: Barbara Cobb and Paul Walker
The Governess in 19th Century Art and Literature
My thesis project analyzes the governess in nineteenth-century art and literature by looking at fictional novels such as Jane Eyre and Villette, and artists such as Richard Redgrave, Rebecca Solomon and more. Through art and literature we will see how the governess is represented and if it remains true to the period in which she exists.

Kirk Raper - Watersciences
Mentors: Howard Whiteman and Thomas Timmons
Effects of Herbicidal Removal of Common Reed on the Diet of Lake Chubsucker in Clear Creek
Research at Clear Creek Wildlife Management Area is being conducted for the investigation of gut contents in a small catostomid fish, the lake chubsucker (*Erimyzon sucetta*), for the purpose of determining whether or not herbicidal treatment and removal of invasive common reed (*Phragmites australis*) is altering its diet. Using six sites at each of three different treatments controlling for presence of Phragmites and herbicidal application, fish were collected over the 2009 and 2010 field seasons. The gut contents of the fish were identified, separated, and quantified for use in statistical analyses. Parameters used for analyses include frequency of occurrence, percent composition by dry weight, and percent composition by number. Though floral communities are expected to change from the herbicidal treatment of a Phragmites infested area, I hypothesize there will be no significant alterations in lake chubsucker diet due to the nature of selective foraging and the limited duration of this study, despite gradual alteration of prey communities.

Elizabeth Ribar - Political Science
Mentor: Ann Beck
Parties vs. Leaders: British Voting Patterns
This paper is focused in comparative politics and examines British politics and voting theory. The hypothesis is that British voters will vote according to party allegiance instead of voting on the strength of the party leader. The research utilizes primary and secondary sources, using a survey of British citizens eligible to vote in the 2010 election and several secondary studies. The primary sources utilize cross-tabulations and descriptive statistics, and the secondary sources were located through textbooks and databases. I expect to find that the hypothesis holds true using election results, especially those from the 2010 elections. This research will reinforce some existing theories on British voting patterns, which state that political parties are more significant to British voters than the people leading the parties.

Caleb Roberts – Biology and Creative Writing
Mentor: Howard Whiteman
Effects of Elk (*Cervus elaphus*) Browse on Woody Plant Communities
Since elk began to be reintroduced in 1997, eastern Kentucky's elk herd has become the largest east of the Mississippi River. In western Kentucky, Land Between the Lakes (LBL) and its Elk and Bison Prairie have served as a source for other eastern elk reintroductions as well as a potential source for reintroducing free-ranging elk into LBL itself. But the success of these reintroductions belies the fact that only a small number of studies have been conducted to measure impacts of this large herbivore on its relatively new eastern habitat. Thus, this study was purposed to further understanding of the consequences of reintroduced elk populations on eastern woody plant communities. I tested one hypothesis: that elk decrease woody plant species diversity, frequency, and reduce plant regeneration. The study was conducted in two areas of LBL: the Elk and Bison Prairie, an enclosure with elk and bison but without deer, and the Oak and Grassland Demonstration Area, an unfenced area with only deer. To measure woody plant communities, random quarter-hectare plots were surveyed within both study areas by pulling transects through them and placing circular subplots along these transects. Along transects, all mature trees' trunk diameters were measured. In the subplots, I measured species diversity, species frequency, stem height, and stem browse history. Herbivore land usage was also measured by pellet frequency along transects as well, to allow species' area usage to be correlated with woody plant community composition.

Ashley Rose - Political Science
Mentor: Ann Beck
How Women Vote in the Kentucky State Legislature
Women have had a strong affect on policy making decisions. On many social issues women legislators tend to vote differently than men legislators. I examine whether women legislators vote differently than men on economic issues in the Kentucky State Legislature. Specifically, I examine the gender of legislators who introduce various pieces of economic legislation and how s/he voted in committees where the economic legislation was considered. This will be done by looking at the past 10 years in the Kentucky State Legislature examining the issues and comparing how the vote varied between men and women.

Nissa Rudh - Biology
Mentor: Michael Flinn and Everett Weber
The Noisy Stream
Exploration into new uses of a passive hydrophone in freshwater environments may be extremely useful across several disciplines. To date, the focus of my project has been on building an acoustic library for physical differences in freshwater habitats and for freshwater invertebrates. If possible, these sounds will be correlated with the lake, pond, or stream's overall health. The project's long-term goal is to develop a hydrophone biomonitoring method that would be simple enough for a layman to use that would yield a wide range of different data about the water body. Programs like ANABAT or RAVEN from Cornell could be used to process this kind of audio data. Knowing what works and what doesn't work is imperative to establishing accurate protocols for these research tools.

Caroline Schmidt, Caitlin Nichols, Jackson Neary, Kevin Colbert and Randall Mitchell - Geoarchaeology
Mentor: Lara Homsey
Service Learning Projects in ARC 350: Public Archaeology
The poster outlines the three major areas of service learning opportunities offered by Murray State University's Department of Geosciences. The service learning projects discussed are associated with the Geoarchaeology area and were mainly utilized by students enrolled in the ARC 350, or Public Archaeology, course. Public Archaeology is a sub-field of archaeology that seeks to educate the public about archaeological issues, national cultural resources, and to promote regional heritage programs. Public Archaeology also assists local governments in identification and preservation of archaeological resources under government jurisdiction, promoting the preservation of national cultural resources for future generations. To gain a greater insight to cultural resource management and preservation, Geoscience majors volunteer for various projects in the Western Kentucky area. A main assignment for the ARC 350 course included conducting a Phase I archaeological survey at a proposed building site in Murray, Kentucky. The procedures for the Phase I survey allowed students to learn about the legal implications associated with cultural resource management. A second class project gave students the opportunity to experience cultural resource management with a local business in Murray, Kentucky. Historical artifacts were found on Sullivan's Golf Course and the owners gave permission for the ARC 350 class to investigate. The class collected surface artifacts, and subsequently washed, sorted and cataloged all artifacts. Outside of the classroom, students volunteer in an on-going repatriation project in coordination with the Wickliffe Mounds State Historical Site, the Chickasaw Nation, and in compliance with the Native American Graves Protection and Repatriation Act.

David Schmoll - Political Science
Mentor: Ann Beck
Israeli Voting Patterns During Wartime
This paper seeks to understand the results of elections in Israel during times of war. I believe when Israel faces direct threats, Israeli voters respond by electing more conservative members than in non-threatening situations. The model consists of all Knesset votes for parties receiving seats in parliament and whether or not war or attacks on Israeli soil had recently occurred. After having run regression analyses on the model, I conclude that there is a correlation between the threat of war and the voting pattern of the constituents.

David Schmoll – Political Science
Mentor: Squire Babcock
Welcome to Dairy Queen: Growing up in Fast Food
This non-fiction piece chronicles my five-year journey as an employee at a Dairy Queen in suburban St. Louis. The stories center themselves around the daily struggles one endures in the world of fast food. There is the constant struggle between employee and boss, employee and customer, employee and employee and employee with himself. The piece ultimately explores my development over five years, my coming of age, and examines fast food America, a segment of our culture, which, for better or worse, says a great deal about us.

Caroline Grace Sharpe - Print Journalism
Mentors: Dan Shope and Lillian Daughaday
The Good, the Bad, and the Ugly: Utilizing Conflict Theory to Analyze Religious and Media Representation of Angels
The perception of angels and angel-like beings has been transformed through different social institutions historically. Early interpretations of angels relied primarily on early Christian believers' visions of how angels appeared and what extraordinary powers they possessed. Later interpretations would increasingly be activated by the growing influence of media, especially highlighted by things associated with the development of popular culture (movies, TV programs, even greeting cards). This paper analyzes the changes of angel interpretation utilizing Conflict Theory within the discipline of Sociology. Ultimately, this paper argues that recent media interpretations of angels coordinated by those with great social power works much in the same way as past religious interpretations; to motivate the perception that angels are still at work protecting those in need, and/or wreaking havoc on a planet populated with mere mortals in need of moral adjustment.

Alexandra Simon - Political Science
Mentor: Reika Ebert
Language Policy in Multilingual South Africa
South Africa is a nation with 11 official languages. Since the end of the apartheid, the country has continuously worked towards unifying its people. A major part of the unification process is going to come from finding a way to connect the citizens across language barriers. We have taken examples from other multilingual democracies, such as India, that are close to South Africa in terms of development, and intend to present how South Africa could adopt these various policies.

Brittany Simons and Sarah Lewis - Dietetics
Mentor: Kathy Timmons
The Acceptability of Various Fat Replacements in Oatmeal Fruit Cookies
The purpose of this experiment is to determine the acceptability of applesauce, pureed lentils, and pureed avocado as fat replacements in oatmeal fruit cookies. Replacements will be substituted at a ratio of 50%. There will be 4 trials, one control using 100% butter for the fat and the other three trials will consist of experimental cookies using 50% fat replacement with the three different substitutions. Descriptive testing will be conducted evaluating the appearance, texture, tenderness, flavor, and overall acceptability of the cookies. Objective testing will consist of spread ratio tests that evaluate the overall quality of the cookie dough. The intent of this experiment is to find fat replacements that are higher in nutritive value and acceptable to consumers.

Claire Smith - Sociology
Mentor: Lillian Daughaday
A Potential Death to the Family
The perpetual output of information from the internet fuels our answers. The multitudes of our generation are addicted to the internet. It might be more appropriate to recognize that the addiction is not just internet, but to the massive amount of technology. This addiction is hurting more than their wallets, but also the people surrounding them. The family is being tortured by this dependence of technology. My hypothesis will focus on technology's attack on the family structure. The family is being abandoned for the desperate need and addiction to technology. Family members are spending hours upon hours of their time on the computer rather than spending time with each other. Social networks like Facebook and MySpace attract teens with thousands of activities. Dating web sites take the people out of the idea of dating. All that is required is a computer and a webcam. Less communication is threatening the level of connection of family ties, which puts the family household in danger. With hours wasted wondering what to put as the next status update, there is no time to wonder what the rest of the family is up to. Technology is not the only threat to the family, however more and more it is becoming the most influential.

Andrew Snyder - Political Science
Mentor: Ann Beck
The Controversy of Standardized Testing
For many years, standardized testing has been a hotly debated topic. Since the inception of the No Child Left Behind Act (NCLB), there has been a renewed focus on this topic. American students' test scores have been stagnant for the last three decades while other westernized, post-industrial nations have improved. This has created a larger achievement gap between the United States and other nations. The focus of this work is to determine what educational systems work and how the United States can decrease the achievement gap.

Shannon Stafford - English
Mentor: Kelley Wezner
Performing Emma
During early nineteenth century Britain, performance was a way for men and women to hide their true nature, manipulate society, and acquire prosperous marriages. Performance was something that was a part of everyday life. The most successful performances occur when the audience is not aware of the performance. In Jane Austen's Emma, Mr. Knightley and Harriet Smith present two of the most successful and subtle performances. Their performances blur the lines between reality and their true feelings. Mr. Knightley, the novel's epitome of propriety, seems above social masquerades, yet performs for the citizens of Highbury. While he performs for the benefit of his own place in society, his performance changes as he develops romantic feelings for Emma and, as a result, he appears more polite and subjugates his own desires and needs than at the beginning of the novel. Harriet Smith is characterized as an innocent, naive, and silly young girl of no station; however, she performs to rise above her own social position. Harriet's performance hinges on her ability to play on sympathies of the other characters, using her vulnerability and complaisance to garner help and access to a higher social sphere. Ultimately, Emma and readers discover her performance when Harriet reaches for the highest ranked available male, Mr. Knightley. Through the characters of Mr. Knightley and Harriet Smith, Austen is best able to show how prevalent performance was during the time period.

Coy St. Clair - Biology
Mentor: Claire Fuller
***Atrazine Exposure Lengthens Cannibalistic Latency in a Dragonfly Larva,* Libellula luctuosa**
Agricultural runoff containing herbicide is known to have adverse effects on freshwater organisms, affecting large groups across trophic levels. Aquatic insects are particularly susceptible, and herbicide runoff has the potential to affect behavior in this group. In size-structured populations, cannibalism helps regulate population densities below environmental carrying capacity, making it a behavior vital to the long-term success of dragonflies. Here I examine the effects of short-term exposure to the herbicide atrazine on cannibalistic behavior in the larvae of *Libellula luctuosa*. Large focal larvae (>12 mm length) were exposed to 0, 1, 10, or 100 ppb atrazine for 96 hours. A smaller (< 8 mm) conspecific was then placed with the focal larva, and its behavior observed for 30 minutes. Time until initiation of stalking and time until strike were noted. After the initial 30 minutes, each pair was checked at 2, 4, 6, 24 and 48 hours. Time of consumption and amount consumed were noted. The number of larvae that engaged in cannibalistic activity within the initial 30-minute observation period was significantly higher for controls compared to all experimental treatments (df=3, P=0.02).When stalking, striking and consumption times were examined together (a measure of overall response time) concentration had a significant effect (df=4,56; P=0.01) with the 10 ppb group significantly higher than the control group (Tukey-Kramer P=0.04). This could have potentially severe repercussions, as smaller larvae may be released from predation pressure by larger conspecifics, compromising the regulatory role of cannibalism.

Mark Stanley - Chemistry
Mentors: Maeve McCarthy and Emily Croteau
Epidemic Modeling of the Black Death, Influenza, and HIV
The Black Death claimed the lives of nearly a fourth of the world's population in the 14th century. Despite yearly vaccines administered to help prevent its spread, influenza is the sixth leading cause of death among American adults. Thirty-three million people worldwide are estimated to be living with HIV, which is terminal and has no cure. Each of these diseases follows a different model, as each one has affected the world during different periods of time, have different vectors of transfer, have different lengths and stages of infection, and have different levels of treatment. The Black Death, during the 14th century, had no cure or effective treatment leading to a large percentage of fatalities. The infection spread by fleas on rats and humans. The model is not a typical SIR model as it takes into consideration the flea population. Influenza is an ever-changing disease with an outbreak frequency of nearly once a year. It is spread by human-to-human contact and is preventable by vaccination. Those cured typically develop antibodies to prevent further infection by that specific strain of influenza. A somewhat typical SIR model therefore represents the flu. HIV is an incurable illness, which has no vaccine for prevention. Spread by sexual bodily fluid transfer, HIV affects the immune system of the host, making them prone to other secondary infections. Simply having a susceptible and an infected group models this.

Meredith Stevenson- Applied Mathematics
Mentor: Chris Mecklin
A Comparison among Traditional Methods in Survival Analysis and Generalized Additive Models for Location, Scale and Shape
Survival analysis is a branch of statistics that is commonly used to deal with censored data. This type of data is problematic because it is known if a patient survived up through the end of a study, but does not let one know how long the patient survived beyond observation. Traditional methods employed when performing survival analysis include the Logrank Test, which is based on the Kaplan-Meier estimator, as well as Cox Regression. It has been speculated that newer techniques, the Generalized Additive Models for Location Scale and Shape (GAMLSS), could be just as effective, if not more effective, than traditional methods at dealing with censored data. This project aims to test the effectiveness of GAMLSS when compared with established methods for survival analysis. This will be accomplished with the use of a dataset recording survival times for veterans with lung cancer, along with a simulation study.

Bridget Stitchnot - Mathematics
Mentor: David Roach
Fractals: The Von Koch Curve
This study looks at fractals, which I will first define. The presentation will include proofs of computing the length of the Von Koch Curve, computing the formula for the area of the Von Koch Curve, and contraction mapping. There will be a presentation of the Von Koch Curve that was created using MatLab.

Tanesha Tabers and Lisa Stone - Nutrition
Mentor: Lisa Stone
The Use of Various Yogurt Variations in a Fruit Smoothie
The purpose of this experiment is to determine which types of yogurts can be substituted in a fruit smoothie, by using four types of yogurts - non-fat yogurt, plain yogurt, Greek yogurt, and frozen yogurt. In addition to different flavors, each yogurt offers a variety of health benefits.

Alysha Taylor and Amber Mills - Biology
Mentor: Maeve McCarthy
The Mathematical Models of Stem Cells and their Role in Cancer
Stem cells are cells in the body that have the ability to reproduce through self renewal and replenish the body through differentiation. In our presentation we will focus on how cancer can develop in stem cells, how they replicate, and how they die. We are analyzing a general mathematical model for normal stem cells and what happens to the model when a mutation occurs. Specifically we are looking at the mutation that causes the failure of programmed cell death. This mutation can occur at any time throughout the lifetime of a cell. There are three stages of differentiation in a cell: stem cell, semi-differentiated (progenitor), and fully differentiated. Mathematical models show the differing effects a mutation has in each stage. The most significant stage is the stem cell stage because it leads to explosive cell growth as shown by the model. Finally we will use leukemia cancer as a specific example of cancer developed by stem cells.

Kristen Tinch- Education
Mentor: Meagan Musselman
Accessible, Visual, and Active: Using Graphic Novels to Improve Adolescent Literacy in Kentucky
Using results from a statewide survey of Kentucky high school English teachers and interviews with teachers across the state, this project analyzes the merits of a relatively new educational tool, the graphic novel. This genre, incorporating both visual art and literature, uses a combination of narrative text and sequential drawings to tell a story. While teachers have been harnessing the potential for graphic novels to spark the interest of reluctant or remedial readers in Kentucky, this project proposes the universal use of the graphic novel to not only engage and motivate non-readers but to teach skills in active reading and visual literacy in an increasingly visual world. Examples will be drawn from a diverse selection of texts, including Marjane Satrapi's Persepolis, the 2011-2012 Murray State University Freshman Reading Experience text.

Rachel Turley – French and Advertising
Mentor: Janice Morgan
L'Oreal, Orange, and Renault: French Companies Expanding Across the World through Advertising
In today's global society, it is important for companies to expand their reach. In the Francophone world, companies have applied new techniques to connect with new market segments. French companies such as Loreal (cosmetics), Renault (automotive), and Orange (telecommunications) have transformed their approach in order to market themselves as global brands. These companies have products and services marketed across five continents and tailor their approach to multimedia to suit the needs of each specific market. Each company narrows their marketing to their target audience, taking into account their audience's cultural background in order to reach them specifically.

Ruojong (Audrey) Wang - Organizational Communication
Mentor: Tina Coffelt
Comparing and Contrasting Relational Closeness and Distance between Chinese and Americans
The purpose of this project is to compare and contrast the relational closeness and distance between Chinese and Americans. In order to learn more about relational affiliation under Chinese and American cultures, this study plans to interview approximately 20 to 25 participants. The participants will be American and Chinese people over the age of 18 who have lived as a non-native in one of the countries or have lived with at least one person from the divergent country for at least six months. Their cross-cultural experiences have enabled them to have a deeper understanding of relational closeness and distance between the two cultures. Of the participants 10-13 will be Chinese, and the other 10-13 will be American. The participants will be students, teachers, etc. Interviews will be audio recorded and transcribed. The analysis will compare and contrast relational closeness and distance between Chinese and Americans. The intended results should reveal emerging themes that (a) justify relational closeness and distance with Chinese and Americans, (b) compare relational closeness and distance with Chinese and Americans, (c) contrast relational closeness and distance with Chinese and Americans. The project is still in progress.

Vincent Waniel - Telecommunications Systems Management
Mentor: Michael Bowman
Online Privacy: Is Internet Usage on a Public Terminal Private, Safe, and Secure?
Due to the popularity of the Internet, various organizations such as universities and libraries have started providing public terminals for Internet access. But are these terminals private, safe, and secure? This research project attempted to identify if personal information could be recovered from a public terminal given differing levels of access to the system - standard users, administrators, and forensic analyst. Collected data was analyzed and cataloged to determine what kinds of information statistically appeared most often and what kind of impact that information had on users' privacy. Data was de-personalized immediately after it was cataloged to protect users' privacy. Based upon the results, we determined the best practices for system administrators and end users to follow to maximize privacy on a public terminal.

Michael Washburn – Agriculture Science
Mentor: Iin Handayani
Tall Fescue Forage Management Effects on Soil Physical Properties
Tall fescue forage systems have been commonly utilized in the United States which could change the magnitude of soil properties. Differences in soil physical properties, such as water holding capacity, macroporosity, bulk density, water content at field capacity, porosity and bulk density indicate changes in soil quality. The objective of this study was to characterize the effects of tall fescue management systems on selected soil physical properties. Soil samples were collected from three tall fescue fields (Tall Fescue Endophyte +, Tall Fescue Endophyte – and Tall Fescue-MaxQ) in Calloway Co. Kentucky. Overall, soil surface properties of the three tall fescue systems were relatively similar, indicating that the magnitude of biomass inputs from grasses were too low to change the soil property levels substantially or their stand age was relatively considered young (less than four years). However, the baseline data generated from this study can serve as starting points for assessing and monitoring the impacts of various tall fescue types on soil characteristic.

Thomas Werfel – Engineering Physics
Mentor: Halim Ayan
Dielectric Barrier Discharge for Living Tissue Sterilization
For some period of time, the use of plasma in medicine has been limited to thermal discharges for cauterization and dissection. The effects of thermal plasma on tissue are entirely related to local heating. Non-thermal plasma, on the other hand, can have many different modes of interaction with tissue. It has recently been demonstrated that direct treatment of smooth surfaces by non-thermal Dielectric Barrier Discharge (DBD) in air is highly effective in killing pathogens such as bacteria. Distinct DBDs are compared with charge patterns (Lichtenberg figures) on photo-films. As evident from the Lichtenberg figures, DBD becomes much more uniform as the voltage rise time decreases. Additionally, sterilization effectiveness of DBD has been investigated by applying the plasma on bacteria culture. It was found that DBD treatment can inactivate E.Coli bacteria within a few seconds. These results hold significant promise for medical applications such as the sterilization of wound surfaces.

Chloe Williams - Psychology
Mentor: Ian Norris
Values and the Perception of Necessity
Extrinsically-motivated individuals (those that value financial success, collecting status symbols, and/or generally seeking the approval/envy of other people who hold the same ideals) place great importance on the acquisition of material goods, possibly because they think they need them. We asked undergraduates ($n = 76$) whether a variety of consumer items were luxuries or necessities. Participants also completed measures of goal-striving and materialism. The number of items considered necessities positively correlated with extrinsic goal pursuit, $r = .42$, $p < .001$, and negatively with intrinsic goal pursuit, $r = -.51$, $p < .001$.

Jeffrey Young - Mathematics and Caleb Roberts - Wildlife Biology
Mentor: Maeve McCarthy
Comparing Zero-Inflation Models to Logistic Regression Models in Chytridiomycosis Research
Chytridiomycosis (chytrids) is caused by a bacteria species *Batrachochytrium dendrobatidis* (Bd), a fungus that is specific to amphibians, living in and on the skin. That this pathogen had a relatively recent appearance belies its impact on amphibian species worldwide. Chytrids has been the cause of many rapid disappearances of species and the declines of many others. These global effects have spawned a massive effort among researchers to understand not only how chytrids affects species but also to understand how it spreads and what exacerbates it. We compare two studies that employed different mathematical models, one in Spain that used a Bayesian Zero-Inflation Binomial Model to account for all the areas and samples that had no presence of Bd, or zeroes, and one in British Colombia that used a logistic regression model for binomial errors and studying whether or not there was exposure to Bd, infection of chytrids, etc. The logistic model is also a slightly more standard approach in that it lets us assume a normal model. Both studies were interested in testing how environmental factors (temperature, solar radiation, longitude, seasons) affected presence and prevalence of chytrids in frog populations.

Meagan Young and Erica McKinney - Nutrition
Mentor: Kathy Timmons
Acceptability of Chocolate Cake with Canned Pumpkin as a Substitute for Fat
The purpose of this experiment is to determine whether there is a detectable difference in flavor, texture, and color of chocolate cake, when canned pumpkin is substituted for butter at different levels.

226b Wells Hall
Murray State University
Murray, KY 42071
270-809-3192 (p)
270-809-3181 (f)
msu.ursa@murraystate.edu
http://campus.murraystate.edu/services/URSA/index.html

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