2018
Poster Abstracts

April 17 & 18
Earlham College
Wednesday, April 18
Poster Session
Trueblood Courts in AWC
10:00 a.m. – 12:00 p.m.

*Posters listed by placement in display area.*
*Please reference the Poster Session Layout diagram on the page 29.*
The EPIC Expo program can be found at earlham.edu/epic-expo.

1-4. **2018 August EPIC Terms: Peace Corps Prep and Medical Interpretation**

*Presenters:*
Jennifer Seely, Aletha Stahl, Peter Blair

5-15. **CS 488: Senior Capstone**

5. **Greenhouse environment analyzed using Bayesian Network**

*Presenter:*
Shihao Chen

*Keywords:*
Greenhouse, machine learning

I'm abstracting the traditional human-interference agriculture into digital analyzing problem. I have developed set of sensors to monitor and extract environment information, and using Bayesian network as a way to find patterns between those variables to determine health level of plant. Data including four factors, humidity in air and soil, temperature, light intensity, and length of plant.

6. **Molecular Docking and Virtualization**

*Presenter:*
Maxwell Meier

*Keywords:*
Virtualization, Molecular Docking, Ease of use

The poster will detail my project, which is about the creation of a virtual machine that allows chemists to more easily use the program DOCK in parallel mode.

7. **Human Activity Recognition Through Smartphone Data**

*Presenter:*
Niraj Parajuli

*Keywords:*
Machine Learning, Human Activity Recognition, Accelerometer, Fitness

The rise of the smartphone era has seen more sensing devices and even more computational power added to these ubiquitous devices. Human activity recognition takes advantage of this by gathering raw data from sensors, evaluating them within the smartphone and predicting user's motion activity. As this active area of research advances, potential applications in many fields including healthcare, fitness monitoring and navigation have been observed. Here, I apply the most commonly used techniques in human activity recognition to build a fitness application using machine learning.
8. **ZUC random number generator**

*Presenter:*  
Zeyang Gao

*Keywords:*  
Random numbers, comparison study, computer science

SPRNG library was developed around year 2000 to support generating huge amount of random numbers in parallel. It passes the randomness test suite of 2000, DIEHARD. However, the test suite which is popular contemporarily is the NIST test suite. This comparison study focuses on examining the quality of SPRNG library against NIST test suite to check its performance and randomness.

9. **Course Recommendation System (using machine learning)**

*Presenter:*  
Adhish Adhikari

*Keywords:*  
Computer Science, Machine Learning, Data Mining, Recommender Systems

Big companies like Amazon, Netflix and Expedia uses different ML techniques to offer recommendations for things. Association rule learning is one such ML technique. The main idea of Association rule learning is to create rules based on previous data to predict future outcomes. For example, past data might show that people purchasing onions and bread also buy tuna (for their sandwich). So the next time another person buys onion and bread, he can be recommended to buy tuna. My project is about applying this technique to recommend courses for university/college students based on past data of course selection.

10. **City Data Visualization**

*Presenter:*  
Honglie Hu

*Keywords:*  
Data Visualization, City

It's about geographical data visualization of city data like criminal data, energy data. In terms of the data visualization, people can have a better idea about how the resources are used in the society, the pros and cons about the usage of the resources. Then, more effective and efficient actions can be made.

11. **Fault Tolerance of IoT Hubs with a Blockchain Algorithm**

*Presenter:*  
Victor Zuniga

*Keywords:*  
Blockchain, Healthcare, Fault Tolerance

Currently, Internet of Things systems in healthcare mirror the IoT systems in other fields despite the importance of the proper functioning of those systems. Many IoT systems rely on hubs in order to control devices or make other decisions. While the embedded devices themselves can tolerate failures through redundancy there is no direct parallel for hubs. This project looks at the application of a blockchain algorithm to provide corresponding security to hubs.
12. **Using Machine Learning to Predict Soccer Match Results with Scikit-learn**

*Presenters:*
Minh Vo

*Keywords:*
Computer Science, Machine Learning, Soccer, Prediction, Scikit-learn

The poster is basically a brief summary of my Computer Science Senior Capstone Experience Project. The poster discusses the application of Machine Learning algorithms in the field of soccer prediction. It briefly explains some soccer background knowledge, the data source, and the tool, Scikit-learn. The poster also presents the framework as well as the methods for determining the Machine Learning algorithms that are the best fit for the purpose of soccer prediction.

13. **Smart Waste Monitoring System**

*Presenter:*
Vitalii Stadnyk

*Keywords:*
IOT, Monitoring, Arduino, Waste

Garbage is a direct source of spreading diseases in underdeveloped countries, and it contributes to the overall estimation of how clean an environment is. Costs that government faces due to continuous waste collection might be simply exceeding country's budget directed to such actions which means that some garbage will not be picked up. As my senior project, I have created a smart waste monitoring system that can constantly track fill level of garbage bin and report collected information to pick-up service workers. This approach increases the efficiency of workers and decreases costs associated with garbage collection.

14. **Bringing Innovative Load Balancing to NGINX**

*Presenter:*
Adam Schwartz

*Keywords:*
Computer Science, Load Balancing, NGINX, The Power of Two Choices

Load balancing remains an important area of study in computer science largely due to the increasing demand on data centers and web servers. However, it is rare to see improvements in load balancing algorithms implemented outside of expensive specialized hardware. This research project is an attempt to bring these innovative techniques to NGINX, the industry leading open source load balancer and web server. In addition to implementing a new, native NGINX module, I have developed a simple workflow to benchmark and compare the performance of available load balancing algorithms in any given production environment. My benchmarks indicate that it is possible to take advantage of more sophisticated load distribution techniques without paying a significant performance cost in additional overhead.
15. **Post-Train Data Addition to Decision Trees**

*Presenter:*
Jeremy Swerdlow

*Keywords:*
artificial intelligence, machine learning, decision trees, performance improvement

Decision trees are one of the most widely used machine learning techniques for classification problems. Current classifiers in real world applications create new decision trees on a regular basis, instead of modifying existing trees as new data becomes available. This process is time consuming, adversely impacting the overall performance of the classifiers. This study focuses on exploring different ways to minimize the time taken for the decision tree to accommodate new training sets. We propose two phased algorithm, which modifies an existing decision tree based on the newly available data set. In the first phase, each record from the training set is compared against the existing decision tree, in order to decide whether a new child node should be created for this node or the value of a node in the tree should be updated. In the next phase, the algorithm adjusts the weights of each node based on newly added data to represent the dataset as a whole. By using this method instead of rebuilding the entire tree, we still gain the benefit of this new data, but reduce the time cost to adding it. While the study is not yet complete, we expect the outcome to be an increase in the accuracy of the model as compared to the original, while experiencing a decrease in the time to make use of the new data.

16-30. **Social Psychology Replication Projects**

*Keywords:*
psychology, research, replication

16. **Piquing interest in a survey to increase participation**

*Presenters:*
Alex Abelkis, Eliana Bookbinder, Noah Kelner, Susannah Rossier

17. **Reminders of freedom to participate and research participation**

*Presenters:*
Cat Canino, Starla Cosgrove, Ibbi Iftikhar, Mubtasim Talha

18. **Sex composition of pairs and body orientation**

*Presenters:*
Haley Arbitelle, McGee Catlett, Evan Hill, Adam Johnson

19. **Reactions to norm violations**

*Presenters:*
Jeremy Douyere, Max Feller, Drew FitzGibbon, Ryoji Fusegi

20. **Compensating for invasion of personal space**

*Presenters:*
Nadia Kousounadis, Avery Salerno, Britanny Timmerman, Dana Yao

21. **Staring at others to influence behavior**

*Presenters:*
Kierra Mikaylin Dennis, James Grace, Yana Miller, Erin Welsh
22. Invasions of personal space

*Presenters:* Jennifer Douyere, Raven McCree, Domanick Michael, Samantha Szyndrowski

23. Gender and door-holding behavior

*Presenters:* Shabnam Fayyaz, Dae Yong Kim, Zhujun Li, Sungeun Park

24. Clothing’s impact on cooperation

*Presenters:* Laura Johnson, Jemayla Nelsonwood, Kevin Whited-Ford, Meg Wyatt

25. Courteous behaviors

*Presenters:* Ella Ballin, Natalija Ljutic, Denny Mataia

26. Group size and social boundaries

*Presenters:* Jovan Cruz, Dakota Fields, Kim Wells, Kassidy West

27. Pairs responding to an invader

*Presenters:* Courtney Bassett, Brooke House, Rosie Jacobs

28. Helping behavior and temperature

*Presenters:* Kito Espino, Nathan Mynatt, Bailey Stewart

29. Salting food and attributions

*Presenters:* Margot Bailey, Ari Schrier, Christian Sharits

30. Elevator behaviors

*Presenters:* Hanna Craig, Hannah Kim, Elise Thompson
31-35. Politics & IS Seniors

Keywords:
grants, theses, and other fun things

Presenter:
Treston Oneal Owens

I am looking at the resiliency of criminal organizations in Brazil particularly São Paulo and Rio de Janeiro’s favelas. I am looking at the well-structured and organized groups known as the Comando Velhermo (CV) and Primeira Comando da Capital (PCC) how they operate like states in the realm of “domestic” services and their interactions with other groups mirroring sovereign state behavior on the international stage. Not only do these groups, offer services for the people in their favelas - such as healthcare, food, security, transportation and legal recourse in trials headed by leader of these organizations; but they also exact effective diplomacy with other groups and Brazilian state entities. These groups are too powerful to be destroyed by police aggressive or passive police actions. This is evidenced by the failure of police and military officials to have a sizable decrease in murders and violence in Brazil. The murders of in Brazil correspond to the ongoing war between CV and PCC as they fight to expand and for more control of drug markets. Because these groups are so sophisticated and well-structured police/military actions have little to no effect on the violence in Brazil.

Presenter:
Sandra Elizabeth Kluivers

In this thesis, I argue that the implementation of national tourism policies and grassroots projects has positive impacts on reducing gender inequality. The national tourism policies implemented result in general benefits being distributed within society; specifically, it leads to increases in female primary school enrollment and female employment in the service sector increase. Furthermore, countries that have implemented their tourism policies and projects through the gender and development theoretical framework of Gender and Development (GAD) experience larger improvements in their gender inequality indicators than those who use the Women in Development (WID) framework. I did my research on Kenya and Tanzania as both are Eastern African countries with developed tourism industries, and Kenya is a case study example of a country using the WID framework while Tanzania is an example of one using the GAD framework. Tanzania showed larger increases in female primary school enrollment and female labor participation in the service sector after the implementation of its most relevant national tourism policies than Kenya did. Furthermore, Tanzania’s grassroots projects show more signs of resulting in sustainable improvements for women in society. This is seen in the provision of more leadership roles for women, providing more opportunities to get involved with local and national politics, and the inclusion of more bottom-up strategies in order to ensure that locals remain in charge of tourism projects that occur in their communities. Therefore, due to the GAD base of its tourism policies and projects, Tanzania showed higher increases in female school enrollment and female service sector employment over time, as well as higher annual growth rates and more female representation in political local and national positions.
**Presenter:**
Jacob Daniel Breen

Epidemic: “The rapid spread of an infectious disease to many people in a given population within a short period.” It’s here in the United States. The Opioid Epidemic is killing the United States from the inside. It’s a disease that is destroying communities, families, and no one is safe. My home state of Ohio is one that has been hit the hardest. It’s all too often you see on the news of two people dead in the front of a car with a baby buckled in back. This sad reality is one that we live in. I propose in my grant that a program is initiated to help stem the tide of this disease. In conjunction with an elder care and rehabilitation facility in Ohio called Quaker Heights, I plan to start a mentorship program for the students in the Waynesville School District. This program would place at-risk students with a mentor and be taught lessons, not just about drugs or risks but about life. Life lessons that can only be taught by someone who’s lived a full life. I believe that Ohio and the US needs these kinds of programs to make the little steps. Then with all those steps together everything will change.

**Presenter:**
Sonia C. Norton

While many scholars have written about the interaction of gender and torture at Abu Ghraib, scholars have not critically examined how scholars created the woman soldier as an individual who simultaneously soldiers and is legible as a woman in scholarly discourse in response to the torture at Abu Ghraib. This study traces the production of the woman soldier through post-Cold War scholarly literature by comparing the effects of scholars’ work writing cisgender female soldiers into or out of legible womanhood before and after the publication of the images of torture at Abu Ghraib. Prior to the Abu Ghraib scandal, scholars discussed women impacted by war separately from cisgender female soldiers, dividing women from soldiers so that soldiers were not legible as women in scholarly literature. However, following the Abu Ghraib scandal, scholars expanded the construction of soldiering to include women. In responding to women’s visible engagement in torture at Abu Ghraib, scholars weaponized women’s bodies, expanded the discourse on violence, and contrasted the woman soldier with the “dangerous brown man.” As this study reveals, torture was the catalyst that combined with U.S. social constructions and led scholars to produce the woman soldier.

**Presenters:**
Ahmed Khanani, Alejandra Traslosheros Reyes, Jacob Daniel Breen, Sandra Elizabeth Kluivers, Sonia C. Norton, Treston Oneal Owens

In Agendas, Alternatives and Public Policies, John Kingdon finds that policy solutions to problems are decided and acted upon at critical junctures, when streams, three largely independent clusters of processes come together. Kingdon assumes that the process is undergirded by the incentive to “satisfy the demands of constituents” vis-à-vis a “credible electoral threat.” Firstly, this paper argues that the politics streams, which captures the dynamics of electoral politics, informs the processes by which the government recognizes problems and selects alternatives. Secondly, this essay considers whether Kingdon’s Multiple Streams approach, designed by observing policymaking in the American federal government during the 1970s, can be applied to contemporary Mexico. Contemporary Mexico is a mosaic of political systems. A single-party state for over seventy years, Mexico began democratizing in the 1980s; the process culminated in 2000 with the election of an opposition party candidate in 2000. Therefore, on the one hand, Mexicans have become less participative over time, despite voting at relatively high rates. On the other hand, indigenous Mexicans have pursued autonomy from electoral politics. Thus, this paper suggests that the dynamics that govern each of the streams — from the criteria to select solutions to the ability to recognize a variety of problems — is altered. This change in dynamics may have a greater impact on the quality of policy than on the frequency with which it is adopted. This paper concludes that the insight of “policy windows” continues to be highly useful, though the streams flow differently.
36. **Environmental Leadership Program: A Year in Review**

*Presenters:*
Rebecca Moore, Ernesto Cabrera

*Keywords:*
Sustainability, Environmental Leadership Program

Come find out what the Earlham College Student Sustainability Corps has been up to for the Academic Year 2017-2018. Discover ways to get involved in the community, meet our SSC members and provide your suggestions for your vision for sustainability at Earlham.

37-46. **Long-term environmental monitoring on Earlham’s campus**

*Keywords:*
environment, monitoring, Earlham, sustainability, science

37. **Earlam’s contribution to carbon dioxide emissions**

*Presenters:*
Situ Thapa, Becca Moore, Garett Schuler, Leo Martin

38. **Temperature’s effects on Dandelion population size**

*Presenters:*
Laura Johnson, Jemma Nelsonwood, Emma Guenthner, Lexi Sharp

39. **Getting to the root of the problem: monitoring soil nutrients at Earlham College**

*Presenters:*
Manuel Rodriguez, Levan Apkhaidze, Carson Smith-Saunders

40. **Miller Farm soil rehab: long term research on soil quality**

*Presenters:*
Garrett Byrd, Kobi Eng, Josue Morales

41. **Hey bud, how’s it growin’? Effects of climate change on the phenology of flowering trees**

*Presenters:*
Tate Ensmenger, Canela Gonzalez, Claire Canady, Ella Ballin

42. **Noise vs. nature: using soundscape ecology to monitor environmental shifts in Earlham College’s landscape**

*Presenters:*
Louisa Perry-Farr, Bailey Thompson, Madeline Chomentowski

43. **Earlam back campus sedge meadow wildlife**

*Presenters:*
Matthew Truex, Alexis Warren, Mary Pearl Ivy

44. **Long term monitoring project: changes in species composition of woody plants in relation to back campus’ environmentally destructed areas**

*Presenters:*
Riley Green, Chloe Lamenzo, Jacob Honn, Libby Fox
45. **Amur Honeysuckle (Lonicera maackii): the back campus invaders**

*Presenters:*
Marcella Lanzillotti, Natalija Ljutic, Christian Sharits

46. **How many Quakers does it take to turn off a light bulb? Discrete intervention strategies towards college house electricity consumption reduction**

*Presenters:*
Alyssa Guritz, Morgan Mack, Eli Ramthun

47-48. **MUSE 317**

47. **Elephants Never Forget**

*Presenter:*
Molly Rannebarger

*Keywords:*
Elephants, museum studies, exhibit design

This exhibition panel was designed for a natural history museum, and discusses the complex social groups and relationships that shape the behavior of African elephants. Just like human children, young elephants both learn from and model the behavior they see. Human activities such as culling or poaching disrupt elephant social structure and result in significant behavioral problems for young elephants.

48. **A Soldier for my Country**

*Presenter:*
Fiona Kelly

*Keywords:*
Women's history, Russia, Military history

The roles of women during WWII were largely confined to the domestic and industrial sphere, and few women allowed to engage in the war front. Russia became the first and only nation to deploy women into active combat during the war, and soldiers such as Lyudmila Pavlichenko readily fought to defend their country. With 309 confirmed sniper kills over the course of one year, Pavlichenko is regarded as the best sniper in history. Learn the inspiring story of how a 25-year-old from Ukraine became the most feared woman in the Russian military and best friends with First Lady Eleanor Roosevelt.

49. **Re-Introducing the Carnot Cycle - Simplifying the Math**

*Presenter:*
John Howell

*Keywords:*
Thermodynamics, Carnot, Thermal Pollution

The Carnot Cycle is important because it tells us the maximum efficiency of heat engines, and therefore how much waste energy pollutes the environment from power plants. The cycle's key equation, \( \frac{Q_{\text{high}}}{T_{\text{high}}} = \frac{Q_{\text{low}}}{T_{\text{low}}} \), appears very simple, but its standard derivation is heavily calculus dependent; therefore, many students find this equation somewhat mysterious when they first encounter it. This poster presents a derivation based on simple ideas about ideal gases and simple graphs, so makes it easier to envision the meaning of this important equation.
50. **Natural Language Processing - Democratizing SQL by building a NLIDBS**  
*Presenter:* Jon Abdulloev  
*Keywords:* Computer Science, Artificial Intelligence, Natural Language Processing  
There are many resources and opportunities available within a community that go unnoticed by the majority of the members of the community. Having an efficient way to connect providers of a piece of resource with consumers of that resource can lead to a more efficient use of a community's resources. One of the most efficient ways to keep track of a community's resources is on a SQL database. However, not every member of a community may be familiar with SQL to communicate with the database. Hence, we can build an NLIDB System to let users make CRUD operations on a SQL database in natural language. Therefore, if any member of the community has access to the SQL database then it would ensure an equitable distribution of a community's resources.

51-56. **MGMT 306 Ennovation Lab - Spring 2018 Entrepreneurial Ideas**  
*Keywords:* Innovation, Entrepreneurship, Social Entrepreneurship, Economic Development, Technology Development, Food Deserts, Richmond, Indiana, Public and Private Partnerships

51. **Project NADA**  
*Presenters:* Aleksa Topalovic, Abdullojon Abdulloev, Lam Nguyen, Nicola Manni, Phuc Tran, Tornike Phanjavidze, Aakarsh Sinha, Vojislav Tatarevic, Xuechen Zhang

52. **Project Mashinani Farmers Initiative**  
*Presenter:* Daniel Kibet

53. **Project Earlham International Hut**  
*Presenters:* Daniel Kibet, Kaien Zeng, Valentino Mbaya, Xuechen Zhang

54. **Project Repurposing the Tivoli Theater Building**  
*Presenter:* Kaien Zeng

55. **Project Urban Garden**  
*Presenters:* Jairo Mendez, Nicola Manni, Valentino Mbaya

56. **Project Dabba**  
*Presenters:* Jairo Mendez, Valentino Mbaya

*Presenters:*
Madeline Gullion, Rosie Jacobs, Kobi Eng

*Keywords:*
Recycling, Sustainability, Compost, Landfill

How high is Earlham's diversion rate? What can be recycled at Earlham? Should education about recycling be made a priority? Join the Earlham Sustainability Core in an interactive poster presentation about sorting through your waste, find out what is recyclable, compostable and how you can stop feeding the landfill.

58. **Energy-Efficient Load Balancing on Cluster Systems**

*Presenters:*
Eli Ramthun, Niraj Parajuli, Phuc Tran, Byron Roosa

*Keywords:*
Energy-efficiency, monitoring, HPC (high performance computing), sustainability

The purpose of the research was to investigate energy consumption of a cluster computing systems under different task scheduling strategies and to propose new strategies that could balance workload and reduce energy consumption. Performance and energy consumption of running the same tasks on the cluster using PBS and Hadoop MapReduce were compared. Additionally, we progressed the work towards an efficient and functional real-time monitoring framework - with additional sensors to monitor inflow and outflow temperatures of our new cluster, a revised structure of the round robin databases used to store collected experimental data, and an improved and optimized monitoring website.

59. **White House Down: Cryptid Edition**

*Presenters:*
Meg Wyatt, Lucy McAfee, Dana Michelle, Sarah Stewart

*Keywords:*
cryptids, security, pixies, lizard man, white house

We are looking at what it takes to get into the White House, uninvited. Using two cryptids, the lizardman and pixies, we will be exploring White House security. Research of security and two accounts of infiltration of the White House in 2009 and 2014 will guide our poster. Alternatively, we will be exploring which of our two cryptids is more capable of breaking into the White House and how far the creature would get.

60-71. **Bonner Scholars Senior Presentation of Learning**

*Presenters:*
Minhwa Choi, Charles Davis, Asa Hendrix-Petry, Chiah Huff, Amanda Johnson, Howard Ly, Duncan McNelis, Juliet Miller, Andrew Pettyjohn, Joely Rios, Olivia Wallace, Kimberly Wells

*Keywords:*
Bonner Scholars, community engagement, service
**Midwestern Plant Extracts Impact Biomarkers of Aging in Caenorhabditis elegans**

*Presenters:*
Minhwa Choi, Lobsang Palmo, Irving Lopez, Raven McCree

*Keywords:*
Caenorhabditis elegans, aging, transcription factors, stress response

Aging occurs to all of us, yet this phenomenon is not fully understood. The model organism Caenorhabditis elegans is ideal for screening for bioactive molecules and for researching mechanisms of aging. Many signaling pathways in these animals are regulators of homeostatic pathways that respond to stress and aging, including transcription factors (e.g. daf-16), protein-folding chaperones (e.g. hsp16.2), and antioxidant proteins (e.g. gst-4). In this project, we tested the impact of extracts from local medicinal plants, including Solidago canadensis, Plantago major, and Ginkgo biloba, on stress response in C.elegans populations, as a proxy of the aging process. We used screening methods including survival to cold- and heat-stress and activation of signaling pathways using fluorescent microscopy. The preliminary results suggest a modified stress response in the populations treated with Solidago canadensis, but not with the other plants at the doses tested. Future projects include screening for effects of medicinal plant treatments on paralysis and on maintenance of aging cell types, including muscles and neurons. In summary, this project builds on our understanding of the molecular and biochemical basis of aging through the lens of plants valued as foods and medicines in the Midwestern United States.

**73-75. REL 305**

**73. Contextualizing Healing: Tibetan, Navajo, and Korean Health Belief Systems**

*Presenters:*
Minhwa Choi, Lobsang Palmo, Lydia Evans

*Keywords:*
Healing, Health Belief Systems, Spirituality

Can mind heal the body? What is the role of religion in healing? Are ceremonies medicine? Using Bonnie O’Connor’s “Structural Model for Thinking About Belief Systems,” we will discuss Tibetan, Navajo, and Korean practices of spiritual healing in the context of their own cultural belief systems. Medical knowledge arises out of cultural worldviews. By understanding the cultural context of traditional healing practices, we can better understand and appreciate them, bringing them into conversation with each other and Western biomedicine.

**74. Structural Violence Against Women and Minorities: Health Care, Rape Culture, and Forced Prostitution**

*Presenters:*
Lillian Cosgrove, Sitashma Thapa, Jasmine Jacklyn Lebron

*Keywords:*
structural violence, sexual violence, women, minorities, health care

In an attempt to raise awareness about the effects of structural violence on well-being, we discuss the injustice that women and minorities face in health care and wider society. As we will show, inadequate sex education, portrayals of women and men in media, and the effects of gender roles on children all contribute to rape culture in the United States. In addition, we will highlight the history and contemporary treatment of minorities in healthcare, as well as a lack of access to adequate health care, as examples of structural violence. Lastly, we will address the special challenges that forced prostitution presents to health care that cut across gender and race.
75. **Herbal Healing in Multiple Sociological Contexts**

*Presenters:*  
Celia Carr, Marena Sein, Rebecca Fischer

*Keywords:*  
herbal healing, medical anthropology, plants

The healing power of plants and herbal practices is acknowledged across the globe. We examine practices of herbal healing in a variety of contexts, drawing on examples such as the experiences of refugees from Burma/Myanmar, communities in rural Appalachia, and people experiencing birth in a variety of settings. Our work strives to illuminate the relationships and tensions present in these systems' encounters with biomedicine, and to explore the continual contemporary relevance of herbal healing practices.

76. **Eurydice Theoretical Sound Design**

*Presenter:*  
Caitlin Cafiero

*Keywords:*  
Design, Theatre, Playlists, Audio

Eurydice, by Sarah Ruhl, is a retelling of the Orpheus myth through the eyes of his beloved, beginning with their love story and going through her time in the Underworld. This sound design was taken to the Kennedy Center regional theatre festival, where it won the design excellence award. The design translates an aural experience to a visual medium by using collage and playlists for each character. I'll be explaining my design process and how script analysis plays into it.

77-79. **Field Botany**

77. **Differences in Community Structure at Edge and Interior of Deciduous Riparian Forests in Wayne County, IN**

*Presenters:*  
Izzi Wilhelm, McGee Catlett, Rachel Riggs, Celia Carr

*Keywords:*  
Botany, Floodplain Forests, Community Ecology, Disturbance

Trees in riparian forests experience stress and disturbance as a result of topography and flooding. This study examines the potential difference in species richness, composition, and biomass between lowland stream edge vs. interior at two local floodplain forests. Preliminary evidence suggests that the structure and composition of the communities differs between the edge of the waterways and the interior of the forests. This study attempts to quantify this observed difference.
78. Effect of forest edges and host tree species on vine loads of Vitis spp., Rhus radicans, and Parthenocissus quinquefolia

Presenters:
Annie McClung, Brady Bubb, Alexandra Bailey, Lillian Lowenfield-Jayne

Keywords:
Plants, lianas, edge effect

In this natural snapshot experiment, we study both the impact of forest edge versus interior and host preference on presence and intensity of vine infestation by three species native to Indiana. We will compare frequency, intensity of infestation by study species between species of tree, sizes of tree, and between edge and interior loci, with the aim of elucidating patterns in liana infestation and understanding what qualities make for a favorable host. At the time of submission, our experiment is ongoing; our preliminary results suggest that host tree species has more significant impact on vine load than edge effect/light availability.

79. Differences in growth architecture of Acer saccharum between forest edge and interior habitats

Presenters:
Eliana Bookbinder, Nick Maloney, Sebastian Slavinskas

Keywords:
biology, botany, trees, tree growth, canopy, Acer saccharum, Sugar Maple, ecology, shade tolerance

Trees development is plastic and highly dependent local conditions. Differences in growth between different environments have implications for evolutionary biology and ecology. Acer saccharum is a ubiquitous shade-tolerant tree in Eastern deciduous forests. Previous research indicates that A. saccharum growth differs in response to local conditions. We examined the growth architecture of A. saccharum in open and shaded habitats and compared their height, internode length, height of first major branch, and canopy depth. Measuring the growth differences between habitats informs the community ecology and development of these forests. Understanding growth and development might aid the preservation of forest habitats.

80. Keeping Bored Math Learners Entertained

Presenter:
Elijah Wilson-Thomas

Keywords:
Math Education
81. **Intermittent fasting**

*Presenter:*
Nguyen-Anh Nguyen

*Keywords:*
Intermittent fasting; weight loss, long-term effect, diseases intervention

Obesity and overweight have become pressing issues around the world, and particularly in the United States. In the midst of this growing problem, demand for methods of weight loss is more than ever. In recent years, intermittent fasting - the process of periodically abstaining from eating - emerged as a "new" approach. I will examine the different methods of fasting and their health effects from three different aspects: weight loss, long-term effects, and diseases intervention. In summary, this infographic will present evidence to help viewers determine whether intermittent fasting is good for health.

82. **Non-Celiac Gluten Sensitivity: Is It Real?**

*Presenters:*
Zoe Wallis, Courtney Scerbak

*Keywords:*
Gluten Sensitivity, Celiacs, Nutrition, Absorption

With the sudden arising of people who are gluten free in the US, more and more research has been put into finding out what gluten free really is. It has been proven time and time again that the gluten free diet is not actually healthier, and in fact can be less healthy, but more recently, a new interest has appeared. The idea that there is an allergy to gluten that is not the traditionally known Celiacs disease. This infographic gives an explanation of what the differences are between Celiacs disease and Non-Celiac Gluten Sensitivity are and how they affect the body, specifically related to the ingestion of gluten—or rather, the inability to ingest gluten.

83. **Can plant-based diets reverse disease?**

*Presenter:*
Juliet Souders

*Keywords:*
Nutrition, Diet, Plant-based, Infographic

In recent years, there have been many diet programs that claim to be able to help people reverse diabetes, heart disease, and obesity, mainly by adhering to a plant-based and (generally) oil-free diet. It seems that for many cases, a plant-based, whole food diet can reduce symptoms of disease, control disease progression, or reverse the disease itself. There are, however, some detractors that claim we don't know enough to know for sure that it is the plant-based diet that prevents disease or other factors. This will be an infographic on plant-based diets.
84-87. **ESEM II: Science in the Modern Age**

*Keywords:*
Slime Molds

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84. **A Single-cell Organism in a Multi-cell World: Slime Mold’s Diet Preferences and Growth in Varying Temperatures**

*Presenters:*
Natalija Ljutic, Esme Mendiola, Yazid Barhoush, Dam Hart, Dominic Saidu

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85. **A Route Best Traveled: A Tale of Slime Mold**

*Presenters:*
Israel Ramos, Shae Stanley, Drew FitGibbon, Opy Akhter, Sam Russo

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86. **The Influence of Elevation and Distance on Foraging Behavior in *Physarum polycephalum***

*Presenters:*
Chloe May Lamenzo, Fiona Kelly, Rebecca Fischer

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87. **Violin or Tuba? The Impact of Pure Tone Frequencies on Slime Mold Growth**

*Presenters:*
Joel Nti-Kyeremeh, Sean Ahn, Jared Ammon, Maeve McNamara

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88. **Meditation and Ice Cream**

*Presenters:*
Yunjoo Shin, Naomi Ongjanco, Mubtasim Talha, Kayla Trevino

*Keywords:*
Stress, Meditation, Neuroscience

Previous studies have indicated that psychological stress is associated with worse physical health (Gianaros & Wager, 2015). This study compared the efficacy of two common stress-reduction techniques: meditation and eating ice cream. We hypothesized that ice cream would more greatly reduce anxiety levels, but that meditation would more greatly reduce physiological stress responses. Participants were exposed to the Trier Social Stress Test speech task, and then either meditated or ate ice cream. Those in the meditation condition reported significantly less anxiety and lower heart rate after de-stressing than those in the ice cream condition.

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89. **Social Exclusion Influences Emotional but not Sensory Aspects of Pain**

*Presenters:*
Maren Schroeder, Ramiro Flores, Yunjoo Shin

*Keywords:*
Peer experiences, pain sensitivity

Previous research shows that analgesic medications, such as Tylenol, can reduce emotional pain that results from social exclusion (DeWall et al., 2010), suggesting that the pain perception is influenced by both physical and emotional factors. The current study explores if reflecting on previous peer interactions influences sensitivity to an experimental pain task. Participants completed the Positive and Negative Affect Schedule (PANAS), and then wrote recollections of being bullied, socially excluded, or socially supported. Afterwards, their pain threshold/tolerance were measured using the cold pressor test. Resulting analyses indicated that pain sensitivity was not influenced by the writing prompt.
90. **Improved Sampling in Molecular Dynamic Studies of Z[WC]-DNA and the B to Z-DNA Transition**

*Presenters:*  
Sirajus Salekin, Muhammad Mujataba, Sunil Pun, Ahmed Imamovic

*Keywords:*  
DNA, Molecular Dynamics, Simulations, BioPhysics, Computation

Although DNA is most commonly found in the right-handed B-DNA structure, it is known that biologically active systems also contain left-handed Z-DNA. ZII-DNA is the most common form among left-handed structures. However, little is known about the transformation from right- to left-handedness. These DNA structures are too small to view physically. Hence, using molecular dynamics we investigate the B to ZII transition with a possibility of Z[WC]-DNA serving as an intermediate structure. Molecular simulations indicate that Z[WC] structures are stable with the current AMBER nucleic acid force field.

91. **Molecular Dynamic Studies of Z[WC]-DNA and the B to Z-DNA Transition**

*Presenters:*  
Ahmed Imamovic, Muhammad Mujataba, Sirajus Salekin

*Keywords:*  
Science, Biology, Physics, Biophysics

This is a research project Michael Lerner has been working on with Earlham students. Using molecular dynamics we investigate the B to ZII DNA transition. Along with targeted molecular dynamics we use umbrella sampling to produce potentials of mean force for the B to ZII transition along both pathways.

92. **Person-focused praise (“hard-worker”) does not influence post-failure outcomes**

*Presenters:*  
Annalee Wilson, Seung Hyo Ki, Lara Khalifeh, Ethan Perkins, Rodrigo Vieira, Daisy Rangel, Jada Wilbanks, Rachael Reavis

*Keywords:*  
praise, mindset, failure, motivation

Although work with children demonstrates that process-focused praise relative to person-focused praise has a positive effect on post-failure motivation, few studies have examined this result in adults. We tested the effect of three types of praise on college students' post-failure outcomes: person-focused intelligence ("very smart"), person-focused effort ("hard worker"), and process-focused effort ("worked hard"). Consistent with studies with children, college students who heard "smart" praise were less likely to attribute their success to effort compared to the other two groups. No other results were replicated in this adult sample, highlighting the need to replicate praise research with adults.
93. Incarceration and Divorce - The impact of absentee fathers on child development

Presenter:
Daisy Rangel

Keywords:
Parental Incarceration, Divorce, Child Development

There has been a significant amount of research on how divorce/incarceration leads to single parent households and impact the development of children. However, there is limited research comparing the effects of divorce and incarceration. This research is focused on comparing the effects of paternal absence due to incarceration and divorce on adult children's perceptions of their childhood. The aim was to evaluate whether the effects of parental absence due to divorce vs. incarceration were similar or different. An existing scale (Kurdek, 1987, p.712) was used and altered to make a second version to fit incarceration. The questions focused on specific domains, such as peer ridicule, stigma, financial strain, etc. This model for questions focused primarily on the child's perspective, causing the adult participants to reflect on their childhood experiences. For my results, I computed an independent samples t-test, comparing responses of participants who had parental absenteeism due to divorce/incarceration for each domain. I found statistically significant differences between the two groups in the domains of reunification, stigma, and economic strain. Overall, my results indicated that children with an absent parent due to incarceration face more or similar adverse obstacles as children of divorced families.

94. Independent Biomedical Engineering Project

Presenter:
Megan Bennett

Keywords:
Biomedical Engineering, McGill University, Independent Project

Last May, I participated in the LIFT Program for first-generation Earlham College students. I had a personal research librarian, Jane Marie Pinzino, as my mentor during my first semester. I created an independent project that took place at McGill University when my LIFT group traveled to Montreal, Canada for our May Term. I met with and interviewed multiple professors and graduate students in the Biomedical Engineering Department to discuss their current research, inspirations, and perspectives on the field.

95. Outdoor Ed Staff Manual Revision

Presenter:
Malia Staab

Keywords:
Manual revision, Outdoor Education, Internship

A summary of my process in revising the Outdoor Education Staff Manual which drives our student driven outdoor education program. My process involved a revision of the mission statement to fit current Earlham practices, outreach to other institutions with similar programs and community feedback on the manual. My poster has a visual of my revision process from the old manual to the current. After being trail tested, the manual is still under revision but this revised living document is something that guides Earlham instructors in the field as they and our program continues to evolve.
96. **AFM Imaging of RNA and Gold Nanoparticles**

**Presenter:**
Isabela Bicalho

**Keywords:**
AFM, gold nanoparticles, RNA

Biomolecules are today used to understand the human body in the future and improve drug delivery. To understand how molecules like RNA work in the body, direct imaging of the molecule provides insights into the mechanism of biological processes. In this research, different RNAs attached to gold nanoparticles were imaged. The instrument used to image the molecules was Atomic Force Microscope (AFM), a powerful tool for nanoscience. AFM provides three-dimensional surfaces profiles with nanometer size resolution. For soft biomolecules like RNA, the tapping mode of the AFM is chosen. At the end of the research, different images of RNA attached to gold nanoparticles were taken, and cursors were used to investigate if the particle's height correctly matched the sample's label.

97. **Assembling and Characterization of Dye-sensitized Solar Cells**

**Presenters:**
Yejin Ki, Linh My To Toan

**Keywords:**
Dye-sensitized solar cells, Titanium dioxide, organic dye, solar testing, Fill Factor (FF), renewable energy, clean energy

Fossil fuels, the leading cause of global warming and biodiversity loss, has been used to satisfy the global energy needs. In response to the global environmental crisis, there have been grown interests in studies on alternatives to fossil fuels, and consequently, it has brought the rapid development of energy conversion devices, which include dye-sensitized solar cells, organic photovoltaics, perovskite photovoltaics, and inorganic quantum dot solar cells. The challenges of the technology are to relieve the tremendous energy demand with the higher efficiency in applications. For this reason, dye-sensitized solar cells become distinguished due to their simple preparing procedure, cost-effectiveness, and high power-conversion efficiency. It has the potential to match the massive scale required to operate a modern economy. In this project, the assembling method of a dye-sensitized solar cell was established, and several modifications were added to improve the quality of solar cells. The calculated Fill Factor (FF), a characteristic of the working solar cell, was found to be 0.86. Further modifications to improve the assembling procedure of a working solar cell were also proposed.
98. **A Comparison of Phytochemicals Present in Earlham Medicinal Plant Extracts**

*Presenters:* Linh My To Toan, Courtney Scerbak

*Keywords:* Chemistry, Medicinal plant, Quantificational analysis

Plants consumed as medicines are thought to exert their physiological effects in part through the activity of their secondary metabolites, which include antioxidants. The overall goal of this research is to compare the chemical compositions of medicinal plant extracts to relate to their bioactive effects when consumed. Specifically, we measured levels of total phenolic compounds and two of their derivatives, flavonoids, and anthocyanins in eight medicinal plant extracts collected from Earlham College in Richmond, Indiana and among different ginkgo leaf preparations. Utilizing 96-well plate assays, the absorbance relative to gallic acid and catechin standards were measured and used to calculate total phenol and flavonoid content, respectively. Using the same 96-well plate template, the absorbance measurements of each plant extract in two different pH conditions were obtained for anthocyanin concentration analysis. We found that the concentration of total phenol content is the highest and the concentration of anthocyanin is the lowest in ginkgo leaf extracts when compared to other berries, leaf, and root extracts. Therefore, the project begins to describe the chemical makeup of medicinal plants valued in the Midwestern United States and forms the basis of a comparative study among different sources, genders, and preparations methods of ginkgo leaf extracts.

99. **Leadership Education and Development**

*Presenters:* Lindsey Grundfast, Molly MacDonald, Alexis Warren

*Keywords:* Leadership

LEAD (Leadership Education And Development) is an eight-part interactive seminar designed to develop personal confidence and leadership for Earlham's female athletes to take to the field of competition, classroom, and beyond. The seminar covered topics including leadership; learning from failure; self-confidence growth by self-reflection; and goal setting: Reality vs. Vision. It is based in leadership theory and practice with each part building on the last and leading to the next. This course is designed for everyone and will enable participants to lead in your own natural self-expression. By utilizing group activities, peer discussions, and real life experiences athletes will grow individually and collectively as well as become confident, effective, empowered leaders for their teams and communities.

100. **Proposed Main Season Change for Women’s Golf and Its Impact**

*Presenters:* Patrick Wright, Hannah Toresdahl

*Keywords:* Title IX, Equity, Sports

The HCAC has proposed a change in the "main" season for women's golf, this would make the majority of the season to partake in the spring, the same season as the men. This would move the conference tournament closer to the national tournament, which would create a fairer practice pattern for the women. There are multiple issues that have brought up throughout the HCAC, such as weather, academic schedules, and availability of coaches.
101. National Girls and Women in Sport Day

Presenters:
Allison Franklin, Kathryn Hulleman, Denisha Mataia, Abbey Smith

Keywords:
community service, experience, athletics

This poster presentation was created in honor of a major community service event our female student athletes were a part of. Young ladies from the Wayne County Boys and Girls Club came to Earlham in celebration of Women in Sport. They participated in sport activities, swimming, and attending a Quaker Basketball game. Our student-athletes took time out of there busy schedules to spend time with these young ladies to give them an opportunity to spend time with collegiate athletes and learn about collegiate sports.

102. Student-Athlete Advisory Committee

Presenters:
Maite Turlings, Emma Lady, Sofia Salvatore, De’Andre Davis, Elijah Bilal, Matt Truex

Keywords:
SAAC, Opportunities, NCAA convention, Community, Events

The Student-Athlete Advisory Committee at Earlham consists of representatives from all 19 sports team on campus. We strive to achieve communication between the student-athletes and the athletic administration and to encourage student-athletes to be involved on campus and in the Richmond community. Being a member of SAAC has offered opportunities for these representatives as going to the NCAA convention, HCAC SAAC meeting, and the APPLE conference. Besides this, SAAC organizes events available for the entire student body to make the college experience even more fun for everyone!

103. The Rise of Multi-Purpose Ride-Hailing Apps in South East Asia

Presenter:
Calvin Pratama

Keywords:
Applications, Technology, Marketing, Mass Transportation, E-Commerce

My EPIC Internship Experience with Grab, a Ride-Hailing Apps in South East Asia. Senior EPIC allowed me to go home last winter and see the result of my projects.

104. Animal Care Alliance Externship

Presenter:
Kelsi Miller

Keywords:
Presentation, Anthrozoology IP, Health Externship Program

In this presentation I will describe which classes I took to complete my Anthrozoology IP, the co-curricular activity I did (Health Externship Program - volunteering/job shadowing at Animal Care Alliance Animal Clinic), and discuss how I believe all of these things fit together, and how the IP/Externship program influenced my future plans, major and self.
105. **Growth of human cancer cell lines in two different conditions**

*Presenters:*
Emi Smith, Shahed Sbeta

*Keywords:*
Human Cell Culture, Cancer Cells

Growing human cell lines is expensive. A critical component of cell growth media is Fetal Bovine Serum (FBS) which costs more than $1.00 per ml. A new product, FBEssence, claims to do the same job as FBS but at almost half the cost. We measured growth rates of four human cell lines: Caco2 (colon adenocarcinoma), Calu3 (lung adenocarcinoma), K562 (lymphoblast leukemia) and GM12878 (immortalized B-lymphocyte) grown in media containing either FBEssence (VWR) or FBS (Atlantic Biologicals). The experiments were conducted without knowing which condition - A or B - contained which additive.

106-107. **Outdoor Trip Leadership - Learning Outcomes**

*Presenters:*
sample of students enrolled in EDUC/AWPE: Outdoor Trip Leadership

*Keywords:*
outdoor experiential education student leadership

This poster is a visual representation of what goes into planning and carrying out a multi-day wilderness backpacking trip. We explore the transferable learning outcomes resulting from an academic course focused on experiential student leadership development.

108. **Correlated motions in the DHFR-NADPH complex**

*Presenters:*
Moataz Noureddine, Annika Hirmke, Malvika Dua

*Keywords:*
Biology, Physics, Computation

Research into the structure and motions of dihydrofolate reductase (DHFR) can be an essential key towards understanding the mechanism of cancer. Using modern techniques of computational biophysics, we ran simulations of the protein while introducing multiple variants of both protein sequence and pH level. Correlated motions are thought to be related to the catalytic step for DHFR; we looked at both correlated and anti-correlated motions across and within the variants. We compared both numerical analyses and simulation videos.

109. **Mapping Lead (Pb) Poisoning Risk in Richmond, IN**

*Presenters:*
Eliza Balch, Yuvraj Bisht

*Keywords:*
Local study, natural resources

Wayne County is in the 95th percentile for cases of Elevated Blood Lead Levels (EBLLs) in the state of Indiana, which is likely associated with the 79% of residential houses that were built before lead paint and lead piping were outlawed in 1986. Using home age as a proxy for lead risk and purchasing price as a proxy for socioeconomic position, we are able to see a clearer picture of the risk gradient across Richmond. This can help determine the source of the contaminant lead, and therefore enable improvement of materials and/or management of lead sources.
110-115. **ESEM II: Social Media, Cyber-Brigades, and More: Aiding the Polarization of Society**

110: **Troll Farms – “The Virtual Eye of Big Brother”**

*Presenters:*
Davit Kvartskhava, Brandon Giordanelli

*Keywords:*
Troll Farms, Russia, Election, Brainwashing

Troll farms have become a weapon to influence the general public opinion. They consist of users or bots that control a number of handles whether on social media, blogs or other kind of websites. This well-thought system conditions people to absorb the ideas that come from the individuals on the other side of the screen. We have tried to explore specific cases starting from Malaysia Airlines Flight 17 to the US 2016 election and also came up the quick fix of this issue.

111: **Social Media in Sports**

*Presenters:*
Tony Boutwell, Sam Thomas Sprockett, Luke Ryan Brake, Austin Baker

*Keywords:*
Sports, Social Media, and Informative

This presentation will introduce participants to the impact social media has on the sports world. Some examples which will be on display are how social media can positively and negatively impact sports organizations and the individual athlete. Given the situations, the plan of action going forward for these organizations and individuals will be to recommend that the relationship between sports and social media should be limited to an extent.

112. **Athletes’ Presence in Social Media: How it Affects Society**

*Presenters:*
Acacia Tenette, Jason Slain

*Keywords:*
Athletes, polarization, social media

This presentation will discuss the polarization that athletes have created in today’s society, by their presence on social media. Their celebrity appearance has given them the ability to easily influence their followers. Both the positive and negative sides of this polarization will be covered in our presentation.

113. **Social Media: My Life Line?**

*Presenter:*
Yujeong Lee

*Keywords:*
Social media, migration, communication, globalization

This presentation challenges the general assumption 'social media is destructive'. Further, it aims to survey the impact of social media in the community of migrants. With the age of globalization, increased were the migrant population around the globe, with different intentions of work, study, or new settlement. This research investigates the usage of social media among the migrant population as an essential way of communication among family, friends, and colleagues.
114. Social Media Usage in Comparison with Academic Performance

*Presenters:*
William Becker, Abigail Armstrong, Julia Park, Ashley Awbrey

*Keywords:*
Social Media, Academics, Correlation

Is there a correlation between the amount of time spent on social media and academic performance? In an attempt to answer this question, we plan on using an observational study. We are going to monitor phone usage and social media usage for the average day for a portion of college students and compare this to credit hours that they are signed up for and GPA. We will do this for multiple people anonymously.

115. Internet Oniomania

*Presenters:*
Trang Nguyen, Tracy Okwaisie

*Keywords:*
Informative, Interesting and Relatable

According to statistical e-commerce data published last year, 96% of Americans shop online, 23% face financial issues such as overspending and end up not receiving their products, 40% face quality issues such as poor quality of clothing. According to studies conducted by the American Medical Association, 6% of Americans suffer from online shopping addiction each year, and the number is expected to increase, this disease poses as a significant risk because can it affect anybody regardless of age, gender or race. Therefore, our poster seeks to investigate the dangers associated with oniomania, symptoms of oniomania and our advice to dealing with it.

116. Non-destructive XRD analysis of Museum Pottery Sherds

*Presenter:*
Minda Dettman

*Keywords:*
Geoarchaeology, Museum Collection, Pottery Sherds, XRD Analysis

X-ray diffraction (XRD) is a common analytical technique used by archaeologists to determine firing temperature of ceramic vessels, provenience of matrix and temper material, and minerals contained in pigment. XRD requires sherds be ground to powder before being analyzed. Destructive analysis is a problem for museum specimens which are often fine examples of an art form, represent a significant cultural or historical episode, or are important interpretive components integral to an exhibition. Through comparing ground and unground samples of visibly diverse sherds, I examine when a non-destructive method of XRD analysis is feasible.
117. “Slate” Artifacts at the Joseph Moore Museum: Materials and Functions of Ground Stone Artifacts from Wayne County, Indiana

*Presenter:* Minda Dettman

*Keywords:* ground stone artifacts, archaeology, museum’s collections, geology

Ground stone tools, formed by grinding down slate and other rocks, are found alongside projectile points and other artifacts at prehistoric sites throughout the Midwest. Investigating the type of stone these artifacts are made of can help identify source quarries, which provide information about movement and trade patterns of prehistoric people. Following a literature survey on ground stone tools in the Indiana and Ohio area, I examined the tools stored in the Joseph Moore Museum collection which were collected as part of the Wayne County archaeological survey, attempting to identify their material to ascertain whether they came from local sources.

118. Geological and Ecological Impacts of Dams

*Presenter:* Madeline Chomentowski

*Keywords:* Dams, Geology, Ecology

This poster is about the geological and ecological impacts of dams, of which there are many, some quite severe. Often these impacts stem from geological factors like reduced sedimentation downstream of dams. This project will examine the implications of dams on the hydrology of areas that are dammed and the impacts on the surrounding ecosystems. Dams can drastically alter the surrounding landscape and have unfavorable impacts on hydrology and ecology of an area.

119. Combining Petrology and Seismology to Track Magma

*Presenter:* Zachary Stevens

*Keywords:* Petrology, seismology, magmas, tracking

In this project, petrology of igneous rocks is used to understand what part of the inner Earth a rock forming magma came from, as well as using seismology to track the movement of magma under the surface of the Earth. Combining these two disciplines would be useful for understanding what seismic activity is indicative of which types of lavas and help inform where lavas are coming from in the inner Earth. Studies in Yellowstone and Hawaii are being used to combine petrology and seismology to gain insight into how composition effects the seismic activity related to lava in these areas.
120. Pyritization of Fossils  
**Presenter:**  
Ethan Thompson  
**Keywords:**  
Geology Fossilization Pyrite  

Pyritization is the process of fossilization where organic tissue is replaced with the mineral pyrite, iron sulfide. It can preserve a higher level of detail and softer body parts than other forms of fossilization and occurs because of sulfur available in decaying organisms and iron dissolved in the water. These formation processes are important to understanding how other soft body fossils form, like those in the Burgess Shale. By looking at pyritization in different environments, including museum display after collection, the processes important for capturing a better picture of organisms that are often lost to preservation bias, can be identifiable.

121. Oil Sands: Requiring Refinement  
**Presenter:**  
Kobe Walker  
**Keywords:**  
oil sands, degradation, environmental impacts  

This research study was conducted to spread awareness to those who are unfamiliar with the oil sands. This study will first introduce the basics of the oil sands (location, composition, recovery methods) and considerations about the production. Additional aims of this study will plunge deeper into the environmental effects such as degrading water quality and deforesting large areas of wildlife and many health considerations. Lastly, through the findings of this study, will offer suggestions on how refinement can help fix the environmental impacts and health issues.

122. The Geological Reason for China’s Dominance in the Rare-Earth Element Market and its Potential Effects on Global Security  
**Presenter:**  
Nathaniel Krautheim  
**Keywords:**  
China, Rare-Earth Elements, Global Security  

China has large reserves of Rare-Earth Elements. The geological reasons that China has come to dominate the Rare-Earth trade, producing large quantities of Rare-Earth Elements, are many. This paper will examine past and potential future threats this poses to global security. Multiple different geological events transpired that allowed for the formation and enrichment of REE’s within the formation known as the Bayan Obo formation. First sediments rich in REE’s deposited and cemented, then an orogeny further enriched the REE’s.
123. Hydraulic Facturing of Marcellus Shale in New York and Pennsylvania

Presenter:
Riley Green

Keywords:
Geology, Hydraulic Fracturing, Environment

This presentation’s aim is to educate people about hydraulic fracturing in the Marcellus Shale formation of Pennsylvania and New York. It will primarily focus on the Earth history of Marcellus Shale and the dangers of hydraulic fracturing. Understanding the geology of hydraulic fracturing is a key aspect of learning how fracking will affect the environment. Policy of how this is done makes the difference in how responsibly these methods are carried out. Understanding how the shale is formed and used will ensure we use these resources responsibly.

124. Marine Paleoclimate Through Halite Deposits

Presenter:
Emma Patterson

Keywords:
Halite, Paleoclimate, Geology, Earth history

Halite, the mineral form of NaCl, is best known for the everyday uses of table salt or road salt, and for its perfect cubic cleavage. However, recent tests of marine halite crystals have determined that ancient halite crystals hold information about the chemistry and cyanobacteria of marine paleoclimates, specifically from the Permian period. More information on such an ancient era can be valuable in determining current climate conditions and risks, as well as increasing our scientific knowledge of earth history.

125. The Mineral Diamond

Presenter:
Sitashma Thapa

Keywords:
Elaborative, Awareness, Graphic

With an aim to give a holistic outlook of one of the most valuable minerals on earth, this poster presentation will present the mineral diamond through geological, ecological and social perspectives. It will include information about the physical and chemical properties of diamond, the geological environments of diamond formation, the production and use of diamond, the environmental implication of diamond, and the issue of conflict/blood diamonds.

126. Soil Carbon Sequestration: A Possible Solution to Climate Change and More?

Presenter:
Padgett Gustavson

Keywords:
Climate Change, Carbon Sequestration, Soil, Agriculture

Poor soil management has been responsible for roughly 80 billion tons of carbon into the atmosphere (Ohlson). The depletion of soil carbon is a biological degradation that occurs when the land is stripped of vegetation, continually disturbed, and extracted from (agriculture). Organic carbon in the soil is important because it facilitates land fertility, the transport of water, and prevents erosion. The carbon that has left the earths soils has negatively contributed to the current climate change we see today. In turn leaving behind soil ill-equipped to perform essential ecological processes. By adopting conservation agriculture, we can reverse these negative effects.