9th Annual

Undergraduate Research Conference 14

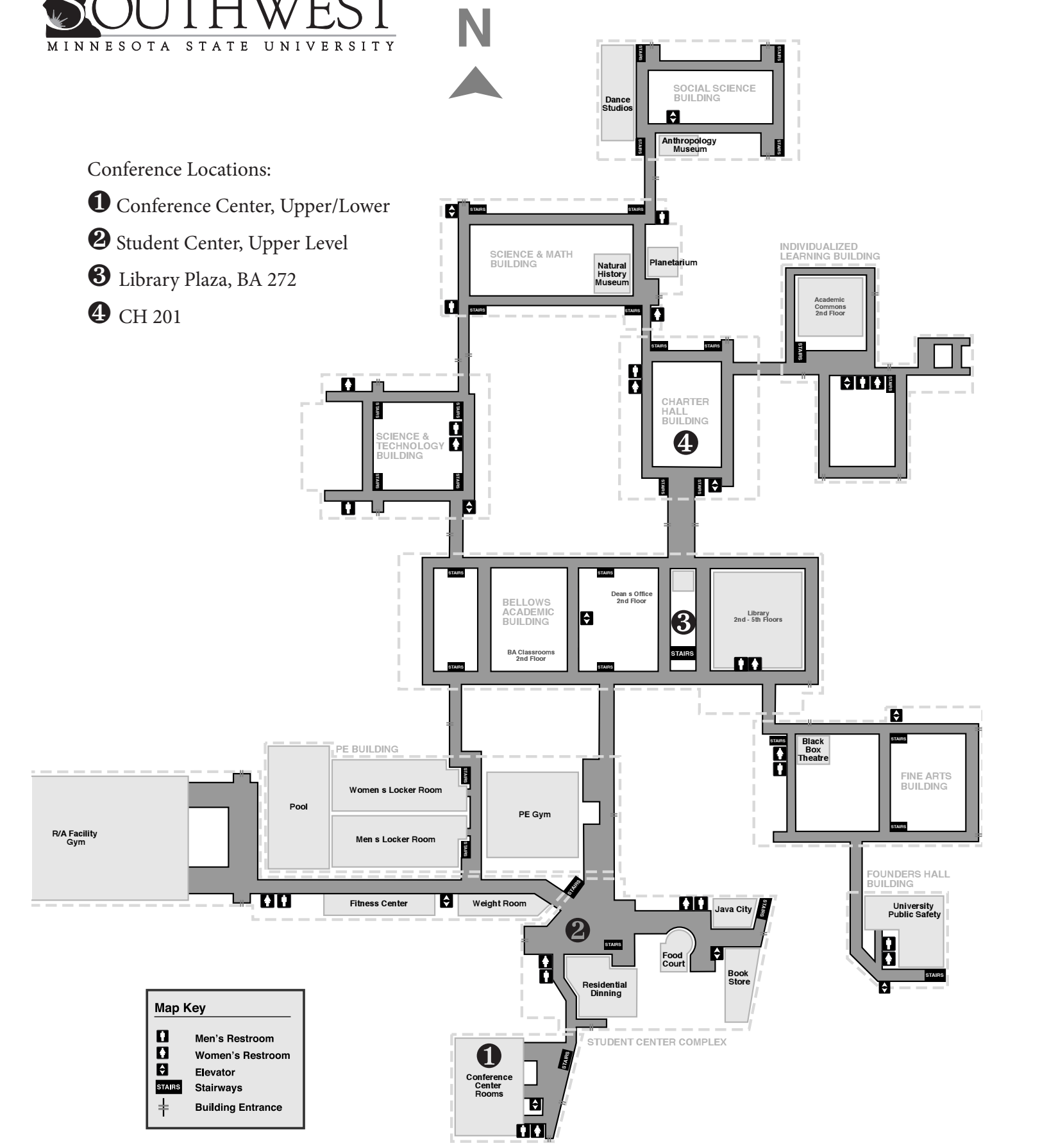
at Southwest Minnesota State University

Wednesday, December 3, 2014

Starting at 8:30 a.m. | SMSU Conference Center

ABSTRACT BOOKLET

SOUTHWEST
MINNESOTA STATE UNIVERSITY



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Purpose

The purpose of the Annual SMSU Undergraduate Research Conference is to highlight the original work done by SMSU undergraduate students at a one-day conference to be held annually at the SMSU campus. The public, including the university and Marshall community, friends, parents, alumni, prospective students and employers are all encouraged to attend and enjoy the excitement of intellectual accomplishments of our students.

How the Conference Started

The conference was initiated fall of 2006 by Dr. Emily Deaver, Professor of Environmental Science. After she and Dr. Thomas Dilley conducted an Environmental Science program review in 2005-2006, it was clear that our science students needed more experience conducting research and communicating the results of that research to the broader community. The 1st Annual SMSU Undergraduate Research Conference was designed as a mechanism for SMSU science students to engage in a professional exchange of scientific ideas, as well as a means to showcase and celebrate their hard work and accomplishments. The first year program included 21 oral and 27 poster presentations from science students in Environmental Science, Biology, Physics and Chemistry. Because of the positive feedback from the academic community the conference was expanded to include all disciplines across campus. Fall 2007 the 2nd Annual SMSU Undergraduate Research Conference doubled the number of presenters with 13 different programs across campus participating. This year, in 2014, there are 18 different programs participating and 28 different faculty advisors. The hope is that the conference will continue to grow each year as we celebrate the intellectual achievements of SMSU undergraduates.

Conference Highlights

2006	21 orals, 27 posters	67 presenters
2007	27 orals, 56 posters, 15 original art	143 presenters
2008	40 orals, 73 posters, 20 original art	178 presenters

2009	25 orals, 77 posters, 18 original art	158 presenters
2010	29 orals, 68 posters, 16 original art	161 presenters
2011	45 orals, 74 posters, 20 original art	185 presenters
2012	49 orals, 102 posters, 6 original art	206 presenters
2013	48 orals, 98 posters, 9 original art	223 presenters
2014	51 orals, 83 posters, 6 original art	192 presenters

Conference Schedule Wednesday, December 3, 2014

Welcome and Keynote

SMSU Conference Center Upper Level

8:30..... Dr. Connie Gores, SMSU President, Opening Remarks
8:45..... Dr. Adam Bergren, National Institute for Nanotechnology
Keynote Address: "Nanotechnology: A Platform for Exploiting the Properties of Small Things in Big Ways"

Oral Session A

SMSU Conference Center Upper Level

9:45..... Josh Hughes, Environmental Science, Comparison of Macrophytes in Ponds under Agricultural, Residential, or Commercial Influences near St. Cloud, MN
10:00..... Jessie Eckroad, Environmental Science, The Natural History of Renville County, Minnesota
10:15..... Colter Fortenberry, Environmental Science, Migratory Waterfowl Survey of Black Rush Lake WPA in Lyon County, Minnesota
10:30..... BREAK
10:45..... Jacob Tews, Environmental Science, A Comparison of Bacterial Communities in a Freshwater Slough in Meeker County, Minnesota
11:00..... Samantha Ritter, Environmental Science, Evaluation of the permanent structural charge of a mixed-layer soil silicate
11:15..... Manisha Prajapati, Environmental Science, Comparing the density and diversity of lichens in SMSU Environmental Learning Area and Camden State Park
11:30..... Travis Meinders, Luke Stadther & Colter Fortenberry, Biology, Characteristics of the Crayfish Populations in the ADM/SMSU Environmental Learning Area Retention Pond
11:45..... Melissa Bartz, Michael Holt & Samantha Ritter, Biology, Factors Affecting Earthworm Density in Lyon County Minnesota Habitats
12:00-1:15 ... Michael McGovern, Gabrielle Cohrs, Todd Chalmers & Madeline Robertson, Creative Writing, "We're All Adults Here"
1:30..... Emma Christensen, Agronomy, Effect of Sulfur Application on Dry Matter Yield of Corn Grown on High Organic Matter Soil
1:45..... Rebecca Sommer, Josh Hughes & Laura Blanchard, Biology, Comparison of macroinvertebrate diversity and abundance in two stormwater runoff ponds of differing ages in Marshall, MN
2:00..... Alexis Walker, Coleton Draeger & Travis Larson, Biology, Summary of Redwood River Monitoring Data Over a 10 Year Period, 2005-2014
2:15..... Coleton Draeger, Environmental Science, Nesting Habitat Comparison of the Wood Duck (Aix sponsa) in McLeod County Minnesota
2:30..... Juni Lama & Dawa G. Rai, Biology, Birds Mortality due to Window Collision in SMSU
2:45..... BREAK
3:00..... Cailin Rogge, Mary Lamb & Benjamin Fick, Scientific & Technical Writing, Increasing Energy Efficiency at Southwest Minnesota State University
3:12..... John Hammonds, Manisha Prajapati & Adam Welling, Scientific & Technical Writing, Health Risks and Cost-Benefit Analysis of College Sports
3:24..... Derek Fox & Ben Malakowsky, Scientific & Technical Writing, Should we add solar panels to SMSU?
3:36..... Victoria Bensel, Chantel Paul & Becky Koepp, Scientific & Technical Writing, Building Health on Campus
3:48..... Jordan R.C. Cross, Erin Kamrath & Megan Evert, Scientific & Technical Writing, New Fitness Center for a

New Generation
4:00..... Cody Petrowiak, Dustin Schulte & Brett Welsh, Scientific & Technical Writing, Alcohol Use on SMSU Campus
4:12..... Erica Downing, Ben Spaeth & Alex Oliver, Scientific & Technical Writing, The Benefits of Green Roofing at SMSU
4:24..... Cody Seehafer & Lauren Doose, Scientific & Technical Writing, Motion Lighting at SMSU
4:36..... Andrew Austin, Demi Rorvick & Kendra Erickson, Scientific & Technical Writing, Composting Awareness at SMSU
4:48..... Tiffany Gehl, Kaitlyn McCaslin & Katie Kaiser, Scientific & Technical Writing, Could hand sanitizing stations be beneficial to SMSU?
5:00..... Meghan Johnson, Emily Schaefer & Carly Salfer, Scientific & Technical Writing, Helping College Students Obtain a Longer Healthy Life

Oral Session B

SMSU Charter Hall 201

9:45..... Zachary Koepke, History, Groundswell: 1980s Farm Crisis
10:00..... Jaclyn Holm, History, Satisfaction Guaranteed
10:15..... Peter Lucken, History, No Place Like Home: The History and Popularity of America's Pastime in Stearns County
10:30..... BREAK
10:45..... Mai Ze Vue, Sociology, How does stigma/blame frames vary by sociocultural factors and social class?
11:00..... Jacob Muller, History, Joseph Renshaw Brown and His Legacy in Frontier Transportation
11:15..... Payton Shively, Theatre, Women in the Shakespearean Era
11:30..... Kyle Havlicek, Theatre, Religious Theatre in the Medieval Era
11:45..... Amy Kay Zimmerman, Cheyenne Jones, Julie Vang & Johntae Ware, Art History, Illuminated Manuscript Show Graphic Design Project
12:00- 1:00 .. Lunch Break
1:00..... Hunter Aubol, Naomi Baker, Marten Salfer & Alex Thies, Art History, Illuminated Manuscript Show Graphic Design Project
1:15..... Jordan Bakken, Political Science, Southwest Minnesota Amateur Sports Center
1:30..... Talitha Black, Theatre, Criticism of Shakespeare
1:45..... Thomas Knudson, Theatre, The Marauded Marlowe
2:00..... Kayla Anderson, Emily Euerle, Meagan Meier & Alexa Thelen, Psychology, Eyewitness Testimony, Trustworthy or Not?
2:15..... Joel Gay, Theatre, Architecture of the English Renaissance
2:30..... Heidi Bengtson, Sociology, Children's Grief, Family Response, and Coping to Terminal Illness
2:45..... BREAK
3:00..... Alex Kluess, Sociology, The Impact of Television Viewing on Adolescents' Sexuality
3:15..... Erin Reps, Sociology, Once Upon a Time…There Was More to the Story. A critical look into the world of stereotypes embedded in beloved Disney "Happily-Ever-Afters" and their influence (or lack there-of) on a popular modern remake
3:30..... Turi Jystad, Theatre, The Influence of Greek Gods on Greek Theatre
3:45..... Valarie Vermillion-Huback, Political Science, Broke in Minnesota: Poverty on the Rise?
4:00..... Derek Ryan Schultz, Political Science, Minnesota Counties and Delivery of Veteran Services
4:15..... Hanifah Abdullah, Political Science, Sulfide Mining in Northeast Minnesota: Costs and Benefits
4:30..... James Saydee, Jr., Political Science, Frack Sand Mining Concerns in Southeast Minnesota
4:45..... Yujim Kim, Theatre, Kabuki and Greek Theatre

Poster Presentation Session A

SMSU Conference Center Lower Level
Posters displayed 8:30 am to 5:00 pm
Authors available at time listed after title
Biology, Chemistry, Environmental Science & Exercise Science

1..... Seifemichael Kenea, Biology, Possible mechanism for melanocyte degeneration and the effectiveness of NB-UVB radiation therapy in repigmentation of Vitiligo, Formal 2:45-3:15, Informal 9:30-10:00

2..... Coleton Draeger, Environmental Science, Observation of Ecological Change in the Clifton Wildlife Management Area Wetland, 3:15-4:45

3..... Travis Meinders, Biology, Treatment of Sickle Cell Anemia With Stem Cells, Formal 3:45-4:15, Informal 9:30-10:00

4..... John Craig & Noelle Beyer, Chemistry, Expression of a Recombinant Enzyme, 1:45-2:30

5..... Courtney Lingen, Biology, Warming of North American Waters: Effects on Mortality and Distribution of Freshwater Fish, Formal 10:30-11:00, Informal 2:00-2:30

6..... Brittney Anderson, Garrett Conn & Chris Ampe, Exercise Science, The Effects of Teleoanticipation on Power in Powerlifters, Anderson 1:00-2:00, Conn 9:30-10:30, Ampe 11:00-12:00

7..... Nathanael Gratz, Biology, Nicotine Induced Atherosclerosis and Possible Relationship to Electronic Cigarette Use, Formal 4:15-4:45, Informal 1:30-2:00

8..... Caci Lingen, Taylor Olson & Fernando Tabares, Biology, Allelopathic Effects of Fresh Ground Coffee on the Growth of Tomato Plants, Lingen/Tabares 9:30-10:15, Olson 2:30-3:15

9..... Alexis Walker, Biology, A model for amphetamine caused behavioral changes, Formal 11:00-11:30, Informal 11:30-12:00

10..... Dylan Johnson, Mikaela Cypher, Nicole Cordes & Travis Radke, Biology, The effects of salt stressing on pea plants (Pisum sativum), Cordes/Johnson 10:15-11:00, Cypher/Radke 1:15-2:00

11..... Mikeal Cooper, Environmental Science, Seasonal Evaluation of Camden State Park's Prairie Pothole, 2:15-3:45

12..... Ben Tonsager, Biology, The Effects of Brain Trauma on the Vestibular Nerve, Formal 1:30-2:00, Informal 11:30-12:00

13..... John Craig, Biology, Potential of S100B as a Diagnostic Biomarker for Schizophrenia, Formal 1:00-1:30, Informal 2:45-3:15

14..... Colter Fortenberry, Environmental Science, Seasonal Study of Yellow Medicine WMA Wetland in Ghent, MN, 1:00-2:30

15..... Theresa Ehnert, Biology, Effects of Resveratrol on Response to Exercise Training on Selectively Bred Rats, Formal 11:30-12:00, Informal 3:45-4:15

16..... Luke Stadther, Biology, The Effects of Saffron's Carotenoids on Prostate Cancer and Proposed Mechanisms, Formal 2:00-2:30, Informal 2:30-3:00

17..... Samantha Ritter, Environmental Science, Investigation of Seasonal Changes in the Independence Park Wetland, 1:00-2:15

18..... Travis Larson, Biology, Current and Prospective Treatments for Duchenne Muscular Dystrophy, Formal 9:30-10:00, Informal 10:30-11:00

19..... Caleb A. Heim, Exercise Science, Comparison of Olympic Weightlifting versus Powerlifting in Collegiate Football Players, 11:00-12:00

20..... Claire Sames, Biology, Gut Microbiota Production of Short-chain Fatty Acids and Their Influence on Obesity via the G-protein Receptor 41 pathway, Formal 10:00-10:30, Informal 1:00-1:30

21..... Devin Ryan, Environmental Science, Ecological Observations of AmericInn Wetland in Marshall MN, 10:30-12:00

22..... Joe Christensen, Biology, Binding Properties of Hemocyanin which allow for Transitions Up and Down the Water Column, Formal 3:15-3:45, Informal 11:00-11:30

23..... Emily Heesch, Paul Schell, Kate Nohner, Biology, Comparing the effects of salt stress on lentils and corn, Heesch/Schell 2:00-2:45, Nohner 11:15-12:00

24..... Rebecca Sommer, Claire Anderson & Pam Sanders, Biology, Preliminary Screening of Lipid Productivity in Algae for Biofuel Use, 10:30-11:00, 2:45-3:15

25..... Caci Lingen, Environmental Science, Evaluation of Ecological Changes in the SMSU Event Center Wetland during Fall 2014, 2:30-4:00

26..... Samantha Ritter, Environmental Science, Impacts of Cover Crops and Tillage Management on Soil Quality in Southern Illinois, 3:15-4:15

27..... Casey Field, Environmental Science, Evaluation of Biological and Chemical Changes in a Freshwater Marsh near Marshall, MN, 3:30-4:45

28..... Josh Hughes, Environmental Science, Evaluation of Temporal Ecological Changes in a Shallow Open Water Community near Marshall, MN, 2:30-4:00

29..... Dustin Schulte, Exercise Science, Differences in health and skill related physical measurements between forwards and backs on the SMSU Men's Rugby team, 1:30-2:30

30..... William Lato, Exercise Science, Plyometric Hopping Exercise to Improve Agility, 2:00-3:00

31..... Catarina Gronau, Environmental Science, Seasonal Observations of a Neighborhood Wetland in Marshall, MN, 9:30-11:00

32..... Travis Radke, Environmental Science, Seasonal Changes in Dovray WMA Type 4 Wetland, 3:15-4:45
33..... Chelsea Robinson, Ashley Slyter & Dillan Hutchins, Exercise Science, Increasing the speed of a wheelchair athlete, Robinson 10:00-11:00, Slyter 11:00-12:00, Hutchins 1:00-2:00
34..... Megan Bruns, Austin LaFollette & Rhiannon Sears, Biology, The Use of Fertilizer to Combat Allelopathic Effects of Garlic Mustard on Tomatoes, Bruns/Sears 9:30-10:15, LaFollette 1:30-2:15
35..... Becky Suter, Exercise Science, Do high heels brand high strength? 9:45-10:45
36..... Kaley Scearcy & Megan Evert, Exercise Science, Functional Movement Screening in Active and Sedentary Men and Women, Scearcy 3:00-4:00, Evert 9:30-10:30
37..... Annette T. Carr, Ashley Timm & Morgan Darner, Exercise Science, Case Study: Ankle-brachial index in Postural Orthostatic Tachycardia Syndrome (POTS), Carr 10:30-11:30, Timm 1:30-2:30; Darner 11:30-12:30
38..... Ashley Daniels, Holly Erickson & Emily Klima, Exercise Science, Improving Balance through Exercise Prescription, Daniels 1:45-2:45, Erickson 9:45-10:45, Klima 3:30-4:30
39..... Casey Hertz, Steven Rohlik, Alan Zimmerli & Morgan Weyer-Coates, Biology, The allelopathic effect of sorghum residue on the germination, emergence, and growth of waterhemp seeds, Rohlik/Hertz 10:45-11:30, Weyer-Coates/ Zimmerli 3:00-3:45
40..... Erica Downing, Katie Erickson & Tara Quast, Exercise Science, The Effects of Caffeine on the Body, Downing 1:15-2:15, Erickson 11:00-12:00, Quast 3:30-4:30
41..... Courtney Lingen, Environmental Science, Seasonal Ecological Observations of the Sleep Inn Wetland in Marshall, MN, 2:45-4:15
42..... Alexis Walker, Bryan Safratowich, Murad Hossain, and Lucia Carvelli, Biology, Amphetamine causes trans-generation behaviors by inducing epigenetic modifications, 2:30-3:15
43..... Samuel VanNevel, Exercise Science, Forced Eccentric Contractions on Gastrocnemius and Soleus Hypertrophy, 3:15-4:15

Poster Presentation Session B

Bellows Academic Library Plaza, BA 272
Posters displayed 8:30 am to 5:00 pm
Authors available at time listed after title
Agronomy, Computer Science, History, Political Science & Sociology

44..... Casey Field, Agronomy, Effects of AVAIL® Treatments on Height and Dry Weight of a Field Corn, 2:30-3:30
45..... Brad Hipsag, Agronomy, The Allelopathic Effects of Coffee Grounds and Extracts on Field Peas, 1:30-2:30
46..... Thomas Sandt, Agronomy, The Effect of Snow Cover on Corn Planted at Different Depths, 2:30-3:30
47..... Ryan Palmer, Agronomy, Effects of Glyphosate on Tall Waterhemp (Amaranthus tuberculatus), 1:30-2:30
48..... Paige Swenson, Political Science, State and Federal Responses to Invasive Species in Minnesota, 1:30-2:30
49..... Teather Lacy, Political Science, Rail Car Shortage in Minnesota, 11:00-12:00
50..... Allison M. Bakken & Jessica Thelemann, Sociology, Race and Gender Portrayed in the Media: A Content Analysis of Front Page and Local Crime Stories in the Minnesota Star Tribune, 2:30-4:00
51..... Sam Opdahl, Computer Science, Cross Platform HTML5 Mario Style Game, 1:00-2:00
52..... Andrew Kruse & Gene (Randy) Briest, Computer Science, Java Decompiler, 1:30-3:00
53..... Duncan Sullivan, Computer Science, QR Tag, 10:30-11:30
54..... WITHDRAWN
55..... WITHDRAWN
56..... WITHDRAWN
57..... Saugat Pradhan, Computer Science, Mustang Rentals, 1:30-2:30
58..... Arnold Siyapche, Computer Science, Patient Management System, 2:00-3:00
59..... Ying Kong Vue, Computer Science, Building an Android App Game, 1:00-2:00
60..... Alex Kitzberger, Computer Science, Small World, 2:00-3:00
61..... Prajula Shrestha & Jordan Twachtmann, Computer Science, Jeopardy Game, 10:30-12:00
62..... Tyler Thompson, Computer Science, Burning Box 3D Engine, 1:30-2:30
63..... Kaity Harms, History, Corruption of St. Paul Police and Newspapers During the Gangster Era, 10:30-11:30

Poster Presentation Session C

SMSU Student Center Upper Level (SC 216)
Posters displayed 8:30 am to 5:00 pm
Authors available at time listed after title
Ag Business, Mathematics & Psychology

64..... Kayla Stenzel & Hailey Becker, Ag Business, Agricultural Development in Zimbabwe, 10:00-11:30
65..... Andy Olson, Ag Business, Developing Agriculture in Niger, 1:30-3:00
66..... Meagan Williams & Angela Rush, Ag Business, Agriculture of Benin, Africa, 2:30-4:00
67..... Rachel Groff, Mathematics, Setting Insurance Companies Policies Prices, 10:30-11:30
68..... MayVang Thao, Mathematics, Tiling Spaces, 1:00-2:00
69..... Jordan Bakken, Mathematics, Who ranks at the top? Using ranking algorithms to rank NFL teams, 10:30-11:30
70..... Julie Thaemert, Mathematics, Making Math More "Common," Minnesota State Standards Better Than Common Core?, 1:30-2:30
71..... Lizzy Bruder, Mathematics, Subtraction: Traditional vs Common Core, 2:00-3:00
72..... Dyreen Nyagesuka, Mathematics, The Golden Ratio and Fibonacci Sequence, 2:30-3:30
73..... Jessica Hulzebos, Mathematics, Predicting Climate Change Through a Mathematical Analysis of Glacial Cycles, 11:00-12:00
74..... Jeffrey Thompson, Mathematics, Quaternions and its Applications For Society: Rotation Sequences Used For Unmanned Weather Satellites, 2:00-3:00
75..... Jordan Geraets, Mathematics, When Do We Learn Best: The Timing of Math is Affecting Student Learning, 3:00-4:00
76..... Kayla Larson, Shelby Julian, April Schulte & Nicole Rasmussen, Psychology, Memory for Organized and Unorganized Words for those with Expertise and No Expertise, 1:30-2:30
77..... Charles Martinson, Psychology, Developing a Personality, 1:30-2:30
78..... Dan Francis, Jr., Kimberly Schumacher, Matthew Carlson & Bailey Andersen, Psychology, Congruent words vs. non-congruent words: How far does the Stroop effect go?, 1:30-2:30
79..... Brian Redemske, Psychology, Gender Differences in the Development of Depression, 1:30-2:30
80..... Honor-Ra Hanson & Monique Beaulieu, Psychology, Effects of Homosexual Parenting on Children, 1:30-2:30
81..... Kaltuma Osman & Spencer Thomas, Psychology, The Effect of Picture and Word Context On Recognition Of Component Parts, 1:30-2:30
82..... Brittany Lade, Greta Jeska, Mark Jankowski & Rachel Trueblood, Psychology, Comparing visual and auditory memory in college students with different learning styles, 1:30-2:30
83..... Carly Salfer & Seth Lewis, Psychology, Benefits of Tutoring, 1:30-2:30

Original Art Works

SMSU Student Center Upper Level
Posters displayed 8:30 am to 5:00 pm
Authors next to work 9:45-10:30 am
Art Program

1..... Jessica Bruss, Graduation Exhibition Artwork, Painting & sculpture combined
2..... Josephine Jobgen, Graduation Exhibition Artwork, Painting
3..... Sia Lor, Graduation Exhibition Artwork, Collage
4..... Traci Otten, Graduation Exhibition Artwork, Graphic Design
5 ..... Jayme Wiertzema, Graduation Exhibition Artwork, Painting
6 ..... Emily Woodrow, Graduation Exhibition Artwork, Graphic Design

Keynote Address: "Nanotechnology: A Platform for Exploiting the Properties of Small Things in Big Ways"

Keynote Speaker: Adam Johan Bergren, PhD
Research Officer
Program Coordinator, Hybrid Nanoscale Electronics
National Institute for Nanotechnology
Edmonton, Alberta, Canada

Adam Johan Bergren grew up among the prairies and corn fields of south central Minnesota. Beginning in 1998, he attended Southwest Minnesota State University, where he majored in Chemistry. From the beginning of his studies, he participated in research, initially determining the amount of Barium metal that was vaporized during a popular SMSU Chemistry Club demonstration known as "the sugar rocket." The results of this research were eventually published, launching Adam's career as a research scientist. After continuing to study chemistry and research electrochemistry in SMSU's Center for Electroanalytical Studies, he graduated with a BS in Chemistry in 2001 and enrolled in the graduate program in Analytical Chemistry at Iowa State University. At ISU, Adam studied charge transport across molecular layers and learned many analytical techniques (once analyzing water that had been in orbit aboard the international space station!). After graduating with a PhD in Analytical Chemistry in 2006, Adam studied as a post-doctoral fellow at the University of Alberta within the National Institute for Nanotechnology (NINT), where he became a staff scientist in 2007, a Group Leader in 2013, and is currently the Program Coordinator for NINT's Hybrid Nanoscale Electronics Program. Adam is the author of 19 publications in peer-reviewed journals, 6 book chapters, is an inventor on 2 patent applications, and has given invited lectures at several international conferences. He resides in Edmonton, Alberta, with his family (Suzanne, his wife of 15 years, and their daughter).

Dr. Bergren's talk will be about nanotechnology, the science of working with atoms and molecules to build devices that are extremely small. Nanotechnology has been used by humans knowingly or unknowingly for centuries. More recently, however, Nanotechnology has emerged as a new branch of scientific technological application space that has brought together scientists from a wide range of backgrounds in order to harness the unique properties of nanomaterials in countless areas. This talk with provide an overview of Nanotechnology and provide examples of its use. In addition, the value of scientific research in the development of technologies and in education will be emphasized. Finally, a discussion of recent research in the development and testing of a hybrid nanoscale analog circuit will be discussed, where the first use of "molecular electronics" in real-world circuitry will be described- in the area of guitar distortion circuits!

Abstracts

Oral Session A – Upper Level Conference Center
Agronomy, Environmental Science, Biology, Creative Writing and Scientific & Technical Writing

1

Title: Comparison of Macrophytes in Ponds under Agricultural, Residential, or Commercial Influences near St. Cloud, MN

Presenter(s): Josh Hughes

Advisor: Drs. Emily Deaver and Thomas Dilley, Environmental Science

Abstract: Macrophytes are a vital component of aquatic ecosystems and are classified as either submerged, emergent, or floating leaved plants. Presence and abundance of macrophytes can vary based on nearby land usage. A vegetation study of three ponds under differing zoning influences (residential, agricultural, commercial) located near St. Cloud, MN was conducted to determine effects on macrophyte abundance and diversity. Eight (10m) transects were sampled in each pond for plant species and abundance in 1m x 1m plots during August 2014. ANOVA determined statistically significant differences in macrophyte abundance. Nine different macrophyte types were identified. Bushy pondweed (*Najas spp.*) and narrow leaved pondweed (*Potamogeton spp.*) were unique to the agricultural pond; softstem bulrush (*Schoenoplectus tabernaemontani*) and smartweed (*Polygonum amphibium*) were unique to the commercial pond. The residential pond had minimal abundance and diversity with only two species present. The other two ponds contained diverse and abundant vegetation indicating healthy ecosystems.

2

Title: The Natural History of Renville County, Minnesota

Presenter(s): Jessie Eckroad

Advisor: Drs. Thomas Dilley and Emily Deaver, Environmental Science

Abstract: Interdisciplinary research into the natural history of Renville County was conducted using academic databases, the Southwest Regional Research Center, and the Renville County Historical Society to better understand the impacts of human activity on the region. The Archaen granitic bedrock in Renville County is some of the oldest rock in the world at ~3.8 Ga. Quaternary glacial moraines supported the native tall grass prairie and glacial meltwaters carved the Minnesota River Basin. Early hunters and gatherers, including the Dakota, utilized the native ecosystem until the arrival of European missionaries and fur traders. In the late1860s, Euroamerican immigrants began farming, and agriculture is still the major shaper of the environment. Renville is reflective of the transformation throughout the Midwest due to farming and related human activity. Using knowledge gained from studying Renville County's past can help to develop policy that will affect the environmental future of the area.

3

Title: Migratory Waterfowl Survey of Black Rush Lake WPA in Lyon County, Minnesota

Presenter(s): Colter Fortenberry

Advisor: Drs. Thomas Dilley and Emily Deaver, Environmental Science

Abstract: Migratory waterfowl are a highly valued natural resource in North America in terms of ecological and economic benefit. A survey was taken spring and fall 2014 to determine the successfulness and overall use of the restored wetland Black Rush Lake WPA and to determine if there were differences in bird population between spring and fall. Twice a week for a month in both the spring and fall observations were taken to determine species, sex, total numbers, and activities. It was hypothesized that there would be a difference between spring and fall in numbers and different species. Common species observed were mallards, teal, shovelers, gadwall, and ringnecks. The results showed that when compared to fall, the spring survey showed more total waterfowl and more species. The restoration of Black Rush Lake WPA appears to be successful in terms of waterfowls' continued use of the wetland.

4

Title: A comparison of bacterial communities in a freshwater slough in Meeker County, Minnesota

Presenter(s): Jacob Tews

Advisor: Drs. Emily Deaver and Thomas Dilley, Environmental Science

Abstract: Bacteria are an integral part of aquatic ecosystems. Carbon source utilization at the community level can reflect the diversity of bacteria within an ecosystem and changes over time. Biolog Ecoplates (31 carbon sources in triplicate) were used to show carbon sources used by aquatic bacteria in samples collected from a shallow freshwater wetland summer 2014. It was expected that bacterial community metabolic activity and

community diversity would increase over time. Water samples were collected monthly from 6 sites (surface and bottom) from May to August. After 72 hours, carbon source use was recorded. The % functional diversity over time showed variation between and within sites, with an overall increase in diversity from May to August. Of the carbon sources available, polymers and carbohydrates were utilized the most. i-Erythritol, a product of fermentation, was used at only one site in May but increased over time. Overall bacterial community diversity increased over time.

5

Title: Evaluation of the permanent structural charge of a mixed-layer soil silicate

Presenter(s): Samantha Ritter

Advisor: Dr. Frank Schindler, Chemistry; Drs. Emily Deaver & Thomas Dilley, Environmental Science

Abstract: Mining, manufacturing, and agricultural practices can add harmful metals to soil affecting groundwater, plants, and animals. The fate and bioavailability of heavy metals is dependent on adsorption sites of clays. The objective of this study was to determine and relate the permanent structural charge, σ_o, of a mixed-layer soil silicate to that of a reference montmorillonite. The mixed-layer silicate was fractionated from a Nicolette clay loam following removal of soluble salts, organic matter, and iron oxides. The σ_o was determined by measuring outer- and inner-sphere complexation using the technique of Cs^+ adsorption. Cesium ion concentration was determined by atomic absorption spectroscopy with ionization suppression. The σ_o of the Nicolette clay (0.55 $cmol_c\ kg^{-1}$ ± 0.072) was significantly higher (P = 0.04) than the reference montmorillonite (0.28 $cmol_c\ kg^{-1}$± 0.064). The Nicolette clay may contain higher tetrahedral charge and a propensity for adsorption of cationic species of lower hydration energy.

6

Title: Comparing the Density and Diversity of Lichens in SMSU Environmental Learning Area and Camden State Park

Presenter(s): Manisha Prajapati

Advisor: Drs. Emily Deaver and Thomas Dilley, Environmental Science

Abstract: Lichens are complex and unique because they are composed of two organisms; a symbiotic relationship between an algae and fungus. The purpose of this study was to identify the species of lichens in SMSU environmental learning area (ELA) and Camden State park (SP) and compare the density and diversity of lichens. Twenty trees at each sample site were randomly selected. One meter up from the ground, a transparent sheet of plastic with a one cm grid was wrapped around the tree trunk and lichen coverage traced on it. Thirteen different species of lichen were identified; 5 species at SMSU and 12 at Camden. Seven types of trees were sampled at Camden SP and 9 types were sampled at SMSU ELA. Using a Chi-Square test, a significant difference in lichen species was found between the 2 sites. The Shannon Wiener Index showed that Camden SP is more diverse than SMSU ELA.

7

Title: Characteristics of the Crayfish Populations in the ADM/SMSU Environmental Learning Area Retention Pond

Presenter(s): Travis Meinders, Luke Stadther & Colter Fortenberry

Advisor: Dr. Betsy Desy, Biology

Abstract: Crayfish are an important staple to the food web of many aquatic environments. They clean up decaying plant matter and dead animals. Also, they provide other animals with a great food source. Crayfish populations are rare in southwest Minnesota, but the ADM/SMSU Environmental Learning Area retention pond is an area in southwest Minnesota that has one. The purpose of this study was to determine the crayfish population density, male/ female ratio, overall size and length of crayfish, and distribution of the crayfish population. Baited traps were placed in three different areas (heavy vegetation, no vegetation, and inflows) of the pond to determine any differences in preferred habitat. The data was collected and analyzed. Analysis showed that male captures significantly outnumbered female captures and that the crayfish preferred denser habitat. Data also showed that the size varied greatly in both males and females, but average size was relatively similar.

8

Title: Factors Affecting Earthworm Density in Lyon County Minnesota Habitats

Presenter(s): Melissa Bartz, Michael Holt & Samantha Ritter

Advisor: Dr. Betsy Desy, Biology

Abstract: Earthworms are non-native to Minnesota, and can have both beneficial and harmful effects in different habitats. In this study, we compared different physical qualities of habitats that may influence earthworm density. We hypothesized that there would be no difference in earthworm density between agriculture, cover crop, forest, and prairie habitats in Southwestern Minnesota. Vegetation was analyzed and the soil was tested for bulk density, pH, and organic matter content. We found

that the prairie had a significantly higher ($p < 0.05$) earthworm density than the other three habitats. Agriculture and cover crop soil had lower pH and organic matter possibly contributing to decreased earthworm populations. Forest soil had extremely low bulk density, whereas prairie soil had less extreme conditions and more vegetation cover. In summary, earthworm density varied among three habitat types in Southwest Minnesota.

9
Title: "We're All Adults Here"
Presenter(s): Michael McGovern
Advisor: Marianne Zarzana, Creative Writing
Abstract: As a writer from the Midwest, I take my stories from the small towns and back roads of Minnesota. I will be bringing my dark sense of humor to bear in a series of short fiction pieces and creative non-fiction stories.

10
Title: "We're All Adults Here"
Presenter(s): Gabrielle Cohrs
Advisor: Marianne Zarzana, Creative Writing
Abstract: I've become fascinated by ordinary life. I use fiction as a way to persuade my readers to be more empathetic to the world around them. Good fiction opens the mind and causes movements that society might not be ready for but desperately needs. I see my writing as a way to accomplish such a shift. Often, I pull from my world, such as personal experiences or issues that have been cast aside for lack of worth. Crafting my own brand of simple realism, I enjoy compelling readers to access all corners of the soul. Humanity is a fascinating story that needs to be mapped. My work offers a critical view of the issues society too often refuses to face.

11
Title: "We're All Adults Here"
Presenter(s): Todd Chalmers
Advisor: Marianne Zarzana, Creative Writing
Abstract: My short stories and poetry focus on the darker side of rural and suburban life. I want to present an unflinching glimpse at the way drugs, sex, alcohol and minimum-wage jobs affect the people who often have the least to live for.

12
Title: "We're All Adults Here"
Presenter(s): Madeline Robertson
Advisor: Marianne Zarzana, Creative Writing
Abstract: Gritty and realistic, my fiction focuses on exploring the human condition. My stories show how differently people can react to less-than-perfect situations. They also illustrate the potential impact even the smallest decisions can have on a character's life. My non-fiction works consist of mainly television and movie reviews, using a more casual voice with the same underlying tone of dark humor to both critique and analyze a variety of works.

13
Title: Effect of Sulfur Application on Dry Matter Yield of Corn Grown on High Organic Matter Soil
Presenter(s): Emma Christensen
Advisor: Dr. Frank Schindler, Chemistry & Lee French, Agronomy
Abstract: Sulfur (S) is a secondary macronutrient essential for good plant growth. Regional Agronomists suspect S applications are not needed on high organic matter soils. The objective of this study was to evaluate the effect of sulfur application on dry matter yield and tissue sulfur concentration in corn (*Zea mays L.*) grown on high organic soils. A 4x4 randomized block study was conducted where S was applied at rates of 5, 15, and 30 lbs ac^{-1} to pots containing soil with 6% organic matter. Soil water status was maintained between 40 and 70 cb tension. Whole plants were harvested at 44 days after seeding, the dry matter yield of above ground plant tissue was determined after drying (<70 °C) to constant weight, and plant tissue was analyzed for total sulfur content. Preliminary results suggest no yield advantage. The effect of S application on dry matter and tissue S concentration is presented.

14
Title: Comparison of macroinvertebrate diversity and abundance in two stormwater runoff ponds of differing ages in Marshall, MN
Presenter(s): Rebecca Sommer, Josh Hughes & Laura Blanchard
Advisor: Dr. Betsy Desy, Biology; Dr. Emily Deaver, Environmental Science
Abstract: Macroinvertebrates are among the first organisms to colonize new aquatic systems and play a vital role in nutrient cycling. Factors such as pond age have been shown to influence macroinvertebrate diversity and abundance. A study of two ponds of different ages located in Marshall, MN was conducted to determine influence of pond age on macroinvertebrate abundance and diversity. Five Hester-Dendy samplers placed in each pond under regimes (within vegetation, edge of vegetation, open water) for two weeks in September 2014 were sampled for macroinvertebrates. Fifteen macroinvertebrate taxa were identified; five were present in both ponds. Only amphipod and midge larvae abundances differed significantly between the two ponds. Within the younger pond, there were

significant differences in abundance of midge larvae between regimes; the older pond had significant differences in abundance of amphipods between regimes. Our data suggest that pond age after one year does not significantly affect abundance or diversity of macroinvertebrates.

15
Title: Summary of Redwood River Monitoring Data Over a 10 Year Period, 2005-2014
Presenter(s): Alexis Walker, Coleton Draeger & Travis Larson
Advisor: Dr. Betsy Desy, Biology; Dr. Emily Deaver, Environmental Science
Abstract: The Redwood River Monitoring Project began in 2004 in Marshall, Minnesota. The project consists of testing various water quality parameters at three different sites; pre, mid, and post-Marshall, in the fall and spring of every year. The purpose of our project was to analyze data from 2004-2014. We statistically analyzed each parameter between the three testing sites and the two seasons. We found that dissolved oxygen levels and temperature were not significantly different between sites and seasons. However, we did find a significant difference in nitrogen and phosphorous levels. Turbidity and flow were also shown to have some significant differences between sites and seasons. The quality of the Redwood River is indeed affected by the city of Marshall.

16
Title: Nesting Habitat Comparison of the Wood Duck (*Aix sponsa*) in McLeod County Minnesota
Presenter(s): Coleton Draeger
Advisor: Drs. Thomas Dilley and Emily Deaver, Environmental Science
Abstract: As wetland habitat is being erased across the landscape for agricultural and developmental use, millions of acres of waterfowl breeding grounds of many different species are being destroyed. The Wood Duck (*Aix sponsa*), a cavity nesting waterfowl which seeks deep holes in trees for nesting are one of many types of waterfowl that are regularly threatened by loss of habitat. Four nest boxes were placed along river and lake sites in order to determine wood duck nesting habitat preference. The boxes were observed once a week to look for nesting activity. It was found that there were very few differences in nesting habitat at both sites. Wood ducks did not nest in either location; however it was found that there were differences in other species. Waterfowl were significantly higher at the lake site while wood ducks where significantly higher at the river.

17
Title: Birds Mortality Due to Window Collision in SMSU
Presenter(s): Juni Lama & Dawa G. Rai
Advisor: Dr. Betsy Desy, Biology
Abstract: Serious injuries to fatal condition can result from bird collision with windows. A billion birds per year die from window strikes around the world (Klem and others 2004). The purpose of our study was to determine the number and species of birds dying due to window strikes around SMSU. Dead birds were collected every other day for five weeks starting from September 28, 2014 and ending on November 3, 2014. We recovered 72 dead birds representing at least 23 species from locals to some migratory birds. Two of the most common birds found were sparrows and warblers. A possible reason for bird strikes is clear windows are not detected as birds attempt to fly from one location to another. And the reflection of trees in windows were also associated with a greater risk of fatality as there was presence of greater number of dead birds, where they had trees near windows.

18
Title: Increasing Energy Efficiency at Southwest Minnesota State University
Presenter(s): Cailin Rogge, Mary Lamb & Benjamin Fick
Advisor: Dr. Amanda Bemer, English
Abstract: The clothes washers and dryers used by students of SMSU are inefficient and outdated, using excessive energy and incompletely washing or drying their clothing. We propose that the washers and dryers be replaced with newer, more energy-efficient machines. This would not only reduce energy usage, increasing the university's "green" credibility, but also save the university money in the long run. Our survey indicates which facilities and types of machines are favored by students, both in frequency and duration of each use. It also shows how much the average student spends on their laundry per use. Using these data, we can estimate how much energy is used by the current, inefficient machines. In addition, our data also shows how much money students could conceivably save by switching to more energy-efficient machines.

19
Title: Health Risks and Cost-Benefit Analysis of College Sports
Presenter(s): John Hammonds, Manisha Prajapati & Adam Welling
Advisor: Dr. Amanda Bemer, English
Abstract: Injuries and financial issues associated with college sports is a widely debated topic, so a

review of various college sports and their financial sustainability and health risk to students would be beneficial. Statistics indicate national cost averages for Division II and Division III sports have dramatically increased in recent times. The highest costing sport nationally was football, and it has the highest injury rates nationally as well as at Southwest Minnesota State University. Four decades of data collection shows most injuries occur during games, and not practice. To save money, sports scholarships can be converted to academic ones. The school could convert to intramural sports for the mostly costly and highest risk sports, or all of them.

20
Title: Should we add solar panels to SMSU?
Presenter(s): Derek Fox & Ben Malakowsky
Advisor: Dr. Amanda Bemer, English
Abstract: To make SMSU more sustainable we proposed using solar panels. Solar energy is booming, and Minnesota is on board. Through Federal, State, and local incentives renewable energy is more affordable. Our hope is that Southwest Minnesota State University can take advantage of these incentives while they last. Solar panels on campus would decrease energy consumption from unrenewable sources which not only pollute, but consistently rise in price. If SMSU was known for being partially solar powered, prospective students who are environmentally aware would be more likely to choose SMSU and be active in "Green" organizations on campus. Saving money with this project will be easier with the available incentives, but we must act soon as they all have expiration dates. By becoming a part of the Energy Revolution sooner rather than later, SMSU can reap the benefits of decreased cost and increased publicity.

21
Title: Building Health on Campus
Presenter(s): Victoria Bensel**,** Chantel Paul & Becky Koepp
Advisor: Dr. Amanda Bemer, English
Abstract: The purpose of this report is to recommend the renovation of the Fitness Center and the adjoining Weight Room at Southwest Minnesota State University. By choosing to renovate the current Weight Room and Fitness Center, SMSU would have a greater potential to entice students to engage in healthier lifestyle habits. Our research focuses on three main points: (1) data collection from other universities, (2) surveys conducted with SMSU staff, students, and student athletes, (3) renovation costs and wanted improvements for the Fitness Center and Weight Room. The results from our research indicate that SMSU will have three benefits from the renovations: (1) the promotion of healthy lifestyle habits will cause a demand for more classes teaching physical activity, (2) provide more jobs (work-study or regular pay) for students on and off campus, (3) an incentive for incoming students to choose SMSU for our Fitness Facility.

22
Title: New Fitness Center for a New Generation
Presenter(s): Jordan R.C. Cross, Erin Kamrath & Megan Evert
Advisor: Dr. Amanda Bemer, English
Abstract: The fitness centers currently available at SMSU are spread out and provide limited space for students and athletes to exercise. After research and interviews, our team proposes that SMSU build a new wellness center to satisfy the needs of our students, athletes, and teachers to promote overall health on campus. This building would have a moderate size exercise area that would supply more equipment than our current weight room. Also, it would incorporate a class room that would be used for exercise science classes and culinary students to promote nutrition. This new building would provide jobs for students and graduates who are seeking a career in sports management. It would also be a possibility to offer the facility to community members and provide various services to help promote SMSU's community health. A new wellness center would be beneficial to our campus.

23
Title: Alcohol Use on SMSU Campus
Presenter(s): Cody Petrowiak, Dustin Schulte & Brett Welsh
Advisor: Dr. Amanda Bemer, English
Abstract: The purpose of this report is to determine if drinking on the SMSU campus is an issue. We interviewed Dave Hemp who is the Director of Environmental Health and Safety, as well as created and conducted different surveys for SMSU students, RA's, and public safety. We surveyed students ranging from 18-25 years old, of which 94% knew what the consequences of drinking on campus were, yet 81% still continued to drink on campus. Of the students who have drank on campus, our survey showed that 76% drank 1-2 days or more weekly and 59% participated in binge drinking. A possible solution to this issue would be for SMSU to create more alternatives to drinking. Creating campus activities in the end of the week and weekends could result in lowering the rate of on campus drinking.

24
Title: The Benefits of Green Roofing at SMSU
Presenter(s): Erica Downing, Ben Spaeth & Alex Oliver
Advisor: Dr. Amanda Bemer, English
Abstract: The purpose of this report is to inform SMSU about the benefits of green roofing. Through internet research and personal communication we have gathered facts and opinions on green roofing. Our research focuses mainly on the cost of installing and maintaining a green roof and benefits of having a green roof on a college campus. Green roofs retain storm water and either filter it out slowly to sewage ducts or can be stored in a reservoir to be used for irrigation. The green roof acts as a regulator of internal temperature by insulating the building. By helping regulate the internal temperature, it decreases the amount of energy being used, therefore decreasing pollution. The installation of green roofs will benefit SMSU by enhancing storm water management, reducing cost of energy, lowering pollution, and by the improvement of human health and comfort.

25
Title: Motion Lighting at SMSU
Presenter(s): Cody Seehafer & Lauren Doose
Advisor: Dr. Amanda Bemer, English
Abstract: The goal of this report is to recommend the installation of motion activated lights in the social science building on campus.in this report we will discuss and analyze the pros and cons to installing motion activated lighting. We started this project thinking by doing this SMSU would save money in energy costs, but after researching we concluded that it is not feasible to install automated lighting with the idea of saving money. There is however some other potential benefits associated with automated lighting. We want to make another recommendation about lighting system that could exploit some of the pros that are associated with motion activated lighting.

26
Title: Composting Awareness at SMSU
Presenter(s): Andrew Austin, Demi Rorvick & Kendra Erickson
Advisor: Dr. Amanda Bemer, English
Abstract: The purpose of this report to raise awareness for the students about the composting program here at SMSU. Our research focuses on three main points: (1) Different methods of composting, (2) Ways to improve the composting bins on campus, (3) Informing students during dining hours, on what items should and shouldn't be composted. Creating more awareness of the composting program would benefit the school by: (1) Students would be more aware of how much food they are wasting, (2) Increasing the composting percentage by 10%.

27
Title: Could hand sanitizing stations be beneficial to SMSU?
Presenter(s): Tiffany Gehl, Kaitlyn McCaslin & Katie Kaiser
Advisor: Dr. Amanda Bemer, English
Abstract: The purpose of this report is to recommend the installation of hand sanitizer dispensers in the computer labs of SMSU. By installing these dispensers, the school will promote students' health through improving hand hygiene. The research needed for this topic was done by: 1) collecting data on the effectiveness of hand sanitizing products, 2) finding examples of other campuses and schools, 3) gathering information on hand sanitizer dispenser models, and 4) conducting a student and staff survey. The results indicate that installing a hand sanitizer dispenser in each of the computer labs will help decrease the amount of bacteria and viruses on students' hands. Other campuses have already installed hand sanitizer dispensers with positive results. Our recommendation is that SMSU installs wall-mounted, pump-to-dispense hand sanitizer dispensers in each of the eight computer labs situated around campus.

28
Title: Helping College Students Obtain a Longer Healthy Life
Presenter(s): Meghan Johnson, Emily Schaefer & Carly Salfer
Advisor: Dr. Amanda Bemer, English
Abstract: College students face a high level of stress. This report examines the causes of those stresses. Through internet research, interviews with professionals, and student surveys, we found out that students stress about time management, financial burdens, exams and school work, and long term organization. To cope with this stress we suggest frequent exercise, healthy eating, and a good social support group. To encourage students to use these coping mechanisms, we recommend offering cheaper and healthier food options in the dining services, free fitness classes on campus, and a first year seminar that helps the freshmen gain time management and budgeting skills.

Oral Session B- CH 201
Art History, History, Psychology, Political Science, Sociology and Theatre

29
Title: Groundswell: 1980s Farm Crisis
Presenter(s): Zachary Koepke
Advisor: Dr. Mike Hofstetter, History
Abstract: Groundswell was a movement by farmers in Minnesota in the 1980s that was a product of actions taken by the Federal government in the late 1970s. Farmers responded to plummeting commodity and land prices by staging rallies, protesting foreclosure sales, and supporting their local communities through proactive actions. Without the help of people involved in Groundswell, more farmers would have lost everything and been helpless to the economic hardships that they faced.

30
Title: Satisfaction Guaranteed
Presenter(s): Jaclyn Holm
Advisor: Dr. Mike Hofstetter, History
Abstract: Every person in the United States knows what the retail store Sears has to offer to its customers, however not every person knows how the store got its start in the business world of everyday life. When people hear the name Sears, they may think of a retailer that once dominated the world of mail order catalogs. However, it is often forgotten that Sears was not the first mail order business, it in fact was the Montgomery Ward & Company. When looking back at the history of the two companies and how it treated its customers it is easy to see how Sears was able to surpass Montgomery Wards. Not only does the history of the two companies give insight into the succession of Sears over Wards, but also what was going on in the world outside of retail, and more importantly in what ways did Sears accomplish "Satisfaction Guaranteed," to his customers.

31
Title: No Place Like Home: The History and Popularity of America's Pastime in Stearns County
Presenter(s): Peter Lucken
Advisor: Dr. Mike Hofstetter, History
Abstract: Stearns County is located in the heart of Minnesota and is known for two very distinct traits. It is the number one producer of dairy products in the state, and it is home to a very popular league of town team amateur baseball. The Stearns County Amateur Baseball League is made up of ten small towns varying in population size from fifty to just over one thousand. This league is unique compared to other leagues in the state in that it has the smallest player eligibility radius of any league in the state, and all towns that compete are within 30 miles of each other. This project focuses the history of the Stearns County League as well as how this small area has been able to maintain such a high quality amateur baseball league.

32
Title: How does stigma/blame frames vary by sociocultural factors and social class?
Presenter(s): Mai Ze Vue
Advisor: Dr. Vicky Brockman, Sociology
Abstract: The purpose of my project is to examine how obesity is stigmatized and the strategies that obese use to cope with negative body images. Recent research has explored how obesity is framed by the public and by professionals. These social problem blame frames include personal responsibility, sociocultural and biological frames. Finally, the strategies that obese women utilize to cope with these framing technique will be explored.

33
Title: Joseph Renshaw Brown and His Legacy in Frontier Transportation
Presenter(s): Jacob Muller
Advisor: Dr. Mike Hofstetter, History
Abstract:

34
Title: Women in the Shakespearean Era
Presenter(s): Payton Shively
Advisor: Sheila Tabaka, Theatre
Abstract:

35
Title: Religious Theatre in the Medieval Era
Presenter(s): Kyle Havlicek
Advisor: Sheila Tabaka, Theatre
Abstract:

36
Title: Illuminated Manuscript Show Graphic Design Project
Presenter(s): Amy Kay Zimmerman, Cheyenne Jones, Julie Vang & Johntae Ware
Advisor: Dr. Pat Brace, Art History
Abstract:

37
Title: Illuminated Manuscript Show Graphic Design Project
Presenter(s): Hunter Aubol, Naomi Baker, Marten Salfer & Alex Thies
Advisor: Dr. Pat Brace, Art History
Abstract: The main purpose of this assignment was to create a poster, postcard and newspaper ad that accurately portrayed what a medieval illuminated manuscript looked like, while also promoting an upcoming exhibit on medieval illuminated manuscripts at the MAFAC gallery in Marshall. Our group tried to make the piece simple, yet eye-catching and used some techniques used in medieval illuminated manuscripts. To successfully do this we used a famous illumination called "The Fourth Angel from the Beatus of Fernando and Sancha" (1047 CE) as the background to tie it all together. We also used Lucida Blackletter as our font and the concept of diminuendo and interaction between the image and text. The whole process was created in Adobe Illustrator and Adobe Photoshop. In the end, our piece successfully portrayed what the exhibit was about while also displaying elements of the original piece and being easy to read and eye-catching.

38
Title: Southwest Minnesota Amateur Sports Center
Presenter(s): Jordan Bakken
Advisor: Dr. David Sturrock, Political Science
Abstract: In the research of the new Southwest Minnesota Amateur Sports Center, I will look at the impact it will have on Marshall, MN, Southwest Minnesota, and Greater Minnesota as a whole in both the future and present impact. The Sports Center has not only had local interest already but also state interest and investment of a total of $12.9 million complex. The impact is expected to have an impact of at least a 200 mile radius of Marshall, which will bring people to Minnesota from three other states. This research includes the revenue and other businesses brought in because of the Sports Center.

39
Title: Criticism of Shakespeare
Presenter(s): Talitha Black
Advisor: Sheila Tabaka, Theatre
Abstract:

40
Title: The Marauded Marlowe
Presenter(s): Thomas Knudson
Advisor: Sheila Tabaka, Theatre
Abstract: The presentation of an overshadowed playwright of the English Renaissance. He is arguably the earliest influence of his time, and his life's end is mysterious. The agent, the poet, the playwright, the life and works of Christopher Marlowe.

41
Title: Eyewitness Testimony, Trustworthy or Not?
Presenter(s): Kayla Anderson, Emily Euerle, Meagan Meier & Alexa T. Thelen
Advisor: Dr. Scott Peterson, Psychology
Abstract: Eyewitness testimony has been a controversial topic in today's court rulings. What people perceive and what actually occurred commonly creates a visual mismatch. This has caused court officials uncertainty about the credibility of eyewitnesses. This experiment tested the memory of participants who viewed a crime scene. Results were analyzed to determine whether there is a difference in memory recall immediately following the viewing of the crime scene versus memory recall an hour later. Participants were asked to answer a questionnaire about the crime scene. They were then shown a second video of potential suspects in a lineup to give them the same feel of identifying a suspect of an actual crime.

42
Title: Architecture of the English Renaissance
Presenter(s): Joel Gay
Advisor: Sheila Tabaka, Theatre
Abstract:

43
Title: Children's Grief, Family Response, and Coping to Terminal Illness
Presenter(s): Heidi Bengtson
Advisor: Dr. Vicky Brockman, Sociology
Abstract: The death of a parent leads to a profound sense of loss and a series of life transitions for children. This paper explores how families respond to terminal illness. A variety of effective coping strategies will be explored. Finally, this project will examine how various programs and services can aid families in meeting the needs of grieving children.

44
Title: The Impact of Television Viewing on Adolescents' Sexuality
Presenter(s): Alex Kluess
Advisor: Dr. Vicky Brockman, Sociology
Abstract: Adolescents are influenced by many socialization factors, but television viewing is having an increasing impact on adolescents' sexuality. When examining the research, there are many

factors to consider as to what adolescents are viewing and how they implement it into their own lives. There are many variables involved including: maternal attachment, maturity, group differences, race, gender, and frequency of viewing television shows. All the variables involved are leaving an impression of stereotypes about sexuality and the double standards society has about different genders and races related to sexuality. Overall the research points to television viewing influencing how adolescents receive their information about sexuality and how they use this information in their lives.

45
Title: Once Upon a Time…There Was More to the Story. A critical look into the world of stereotypes embedded in beloved Disney "Happily-Ever-Afters" and their influence (or lack there-of) on a popular modern remake
Presenter(s): Erin Reps
Advisor: Dr. Vicky Brockman, Sociology
Abstract: Disney animated films have been a mainstay in American culture for over seventy-seven years. Millions of children around the world have grown up watching iconic Disney characters bring to life beloved stories. Despite Disney's popularity, the company's films garner criticisms regarding race, gender, and age stereotypes. Some critics even highlight the negative images of mental illness and child maltreatment found in some films. This project reviews the literature exploring how stereotypes are embedded in these classics and how these portrayals have changed over time. A content analysis focusing on a modern remake of old classics was conducted using the television series *Once Upon a Time.* The findings show that change is occurring, but stereotypes still persist.

46
Title: The Influence of Greek Gods on Greek Theatre
Presenter(s): Turi Jystad
Advisor: Sheila Tabaka, Theatre
Abstract:

47
Title: Broke in Minnesota: Poverty on the Rise?
Presenter(s): Valarie Vermillion-Huback
Advisor: Dr. David Sturrock, Political Science
Abstract: Poverty is a social disease which affects millions around the globe. The largest subsets of those affected are women, especially minority women. This paper will identify the increase risk for women, present various theories of resource allocation to address the issue, major disadvantages facing rural locations trying to provide essential services and illustrate a trial program such areas could utilize using Marshall, MN as the model city. The main focus of the paper will be rural locations in greater Minnesota, as well as any adverse effects associated with poverty. Some issues included will be healthcare access and the quality of housing available for the poverty stricken. Solutions for poverty are available in rural setting when one is willing to utilize creative solutions.

48
Title: Minnesota Counties and Delivery of Veteran Service
Presenter(s): Derek Ryan Schultz
Advisor: Dr. David Sturrock, Political Science
Abstract: To explore the process of delivering services to veterans and how it benefits our state, counties and communities. I will be researching the importance of the position of the CVSO (county veteran's service officer) in regards to its connection to state and federal programs and how current and future legislation affects it and what it means to the estimated 80,000 veterans in the state of Minnesota. The objective of this study is to learn the importance of this county position, but also analyze the benefits that the individual county and the communities acquire from a good working relationship with returning veteran's and those already established. To research the many accomplishments of the CVSO position from past and present, and lastly to show how future legislation could affect those services, and what that means for counties individually and the state of Minnesota.

49
Title: Sulfide Mining in Northeast Minnesota: Costs and Benefits
Presenter(s): Hanifah Abdullah
Advisor: Dr. David Sturrock, Political Science
Abstract: Two leading organizations in the sulfide mining proposal (Twin Metals and PolyMet) seek to mine sulfide ores in the Northeastern region of Minnesota to produce large quantities of profitable metals like copper, nickel, and gold. Because it's immensely difficult to completely eliminate harmful effects caused by modern day advancements that prove to be beneficial in some ways to the population, we must therefore make every effort to evaluate the pros of projects underway in conjunction with analyzing the extent to which the environment and its wide variety of occupants could possibly be affected. If the sulfide mining project doesn't pass we would never be able to truly see how it could have become a great boost for the economy as a whole and for those without jobs. However, if the sulfide mining project does succeed

it could potentially have many detrimental effects on our entire ecosystem.

50

Title: Frack Sand Mining Concerns in Southeast Minnesota

Presenter(s): James Saydee, Jr.

Advisor: Dr. David Sturrock, Political Science

Abstract: The basis of this paper was to reveal why frack sand mining is a major concern for southeast Minnesota. Landowners and local governments have been the beneficiaries of the mining practice but communities remain divided. The concerns of frack sand mining include contamination of ground water, decrease in air quality, depletion of fresh water, destruction of land, and triggering of earthquakes. None of the states at the center of the current frack sand mining boom have adopted air quality standards for silica that can adequately protect the tens of thousands of people living or working near the mining locations. Individuals living near frack sand mining in SE Minnesota are witnessing a massive destruction of their rural landscape. The process of sand mining is very destructive to the natural beauty of the rural Midwest.

51

Title: Kabuki and Greek Theatre

Presenter(s): Yujim Kim

Advisor: Sheila Tabaka, Theatre

Abstract: Ancient Greek and Kabuki theatre considered the ones have fundamental effect on modern Eastern and Western Theatre. By compare and contrast these two forms of theatre, there will be extended understanding regarding the different cultures around the world. First, the history of these theatre will be discussed to understand the genesis of these two forms. Second, the similarity of these art forms will be presented. Then, the difference will be discussed. Since the modern theatre formation or art merge between Western and Eastern cultures, it will be very much interesting to go over the history and fundamentals of two distinguished theatre formation.

Abstracts

Poster Session A – Biology, Chemistry, Environmental Science & Exercise Science

1
Title: Possible Mechanism for melanocyte degeneration and the effectiveness of NB-UVB radiation therapy in repigmentation of Vitiligo
Presenter(s): Seifemichael Kenea
Advisor: Dr. Pam Sanders, Biology
Abstract: Vitiligo patches are de-pigmented regions of epidermis due to the loss of functioning melanocytes. The lack of a safe and effective treatment option which halts the progression and produce satisfactory repigmentation, contribute to the adverse psychological and sociological effect patients endure. Here I evaluated two articles that investigate a new mechanism and treatment. Jian *et al.* (2014) investigated whether the impaired nuclear localization of transcription factor Nrf2-ARE in the presence of H_2O_2 resulted in the death of vitiligo melanocytes. This impairment led to decreased response in production of heme oxygenase-1, a key enzyme in protecting melanocytes from oxidative stress. Yones *et al.* (2007) conducted the first double-blind randomized clinical trial comparing the well-established therapy psoralen plus ultraviolet A with NB-UVB radiation therapy. Patients in the NB-UVB radiation group were more compliant with the treatment, had a higher reduction in body surface area with vitiligo, and showed fewer adverse effects.

2
Title: Observation of Ecological Change in the Clifton Wildlife Management Area
Presenter(s): Coleton Draeger
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: Wetlands are areas that are inundated or saturated by surface or groundwater at duration sufficient to support a prevalence of vegetation adapted for life in saturated soil conditions. The study of ecological change and water quality in a wetland can provide knowledge of a changing ecosystem. A 66.5 acre wetland in Clifton Wildlife Management Area, located 2 miles south east of Marshall, Minnesota, was studied to observe ecological change and monitor water quality as the seasons changed from summer to fall. Water quality measurements were taken every two weeks from September 4th to October 30th, 2014. Water temperature, depth, pH levels, alkalinity, and dissolved oxygen all changed over the 10 week study period. As expected temperature decreased over time, but other parameters were more variable. Completion of this observational study showed that seasons do alter water quality and ecological aspects of a wetland.

3
Title: Treatment of Sickle Cell Anemia with Stem Cells
Presenter(s): Travis Meinders
Advisor: Drs. Vaughn Gehle and Pam Sanders, Biology
Abstract: Sickle cell anemia is a blood disorder that affects about 1 out of 12 African Americans. Given that a mutant protein, Hemoglobin S, causes sickle cell anemia, a cure requires genetic manipulation. Ryan et al. (1997) developed a knockout-transgenic mouse model of sickle cell disease to test drug and genetic therapies. The knockout-transgenic mice synthesized human hemoglobin similar to human patients with sickle cell anemia, resulting in a successful mouse model that allows for drug and genetic therapy testing. Hannah et al. (2007) treated these knockout-transgenic mice with sickle cell anemia using stem cell transplantations. Results indicated a significant reduction in HbS protein levels four weeks after transplantations in the blood of treated mice. Also, morphological analysis of red blood cells in blood smears of treated mice showed diminishing numbers of rigid sickle cells. Before human trials can begin the problems associated with these methods need to be overcome.

4
Title: Expression of a Recombinant Enzyme
Presenter(s): John Craig & Noelle Beyer
Advisor: Dr. Noelle Beyer, Chemistry
Abstract: We are undertaking a project involving the analysis of an enzyme produced in an engineered *Escherichia coli* strain. This is part of a broader project involving the development of a set of experiments for biochemistry lab, where students would experience the scope of enzyme analysis by growing *E. coli*, isolating, purifying, and quantifying the enzyme of interest, and studying the kinetics of the final purified enzyme. We believe the experience of enzyme production and analysis would develop valuable skills for graduate studies or employment in fields such as bioengineering or biochemistry. Our current project involves analyzing crude protein

production in recombinant *E. coli* and comparing it to protein production in control *E. coli*. We are also attempting to use an affinity-tag to purify and isolate the enzyme of interest. Once production of the enzyme of interest has been validated, we will attempt to optimize growth conditions to maximize enzyme production.

5

Title: Warming of North American Waters: Effects on Mortality and Distribution of Freshwater Fish

Presenter(s): Courtney Lingen

Advisor: Dr. Pam Sanders, Biology

Abstract: Global warming due to climate change can affect expansion/reduction of distributions, species productivity, and species interactions. I reviewed two studies that analyzed the effect of warming waters on the distribution and mortality of North American freshwater fish. Cline et al. (2013) studied changes in species distributions of walleye, salmon, and lake trout from 1979-2006 due to global warming. Results showed that walleye habitat expanded across the majority of the lake. Lean lake trout habitat decreased slightly, and Siscowet lake trout and salmon habitat remained similar. Walleye, salmon, and lean lake trout's preferred thermal habitat increased by a month, and Siscowet trout's decreased in 2006. Biro et al. (2007) studied the growth and survival of rainbow trout in 17 lake systems. The results showed that temperatures that exceed the optimum temperature reduced the growth and survival of trout populations. Both articles offer support that global warming causes shifts in fish populations.

6

Title: The Effects of Teleoanticipation on Power in Powerlifters

Presenter(s): Brittney Anderson, Garrett Conn & Chris Ampe

Advisor: Jeffrey W. Bell, Ph.D, Exercise Science

Abstract: Teleoanticipation theory suggests athletes predetermine intensity and pace based off various cues before exercise onset. Teleoanticipation has been previously tested with cycling and running events, but not with weightlifting. This study sought to determine how teleoanticipation affects average power, average velocity, and peak force during bench press of powerlifters. Six well-trained powerlifters were tested (22-48 years, 87.5-163.8 kg, 172.72 cm-185.42 cm, arm length 57-60 cm). Subjects were randomized to perform the short before long after control or vice versa. Using a Tendo Power Analyzer Unit, subjects performed 3 sets of repetitions (6, 10, or 14) with perception of performing 10, but 2 sets were suddenly increased/decreased. Average power was 55.75±32.91 Watts higher in control compared to long set (p=0.043) and average velocity was -0.072±058 m/s higher in control compared to long set (p=0.089). All other variables were similar. Further research is needed with more subjects and tested with fewer repetitions.

7

Title: Nicotine Induced Atherosclerosis and Possible Relationship to Electronic Cigarette Use

Presenter(s): Nathanael Gratz

Advisor: Dr. Pam Sanders, Biology

Abstract: Atherosclerosis is a leading cause of death, (Porter *et al.,* 2011) and cigarette smoking is a risk factor for atherosclerosis (Jieun and Cooke, 2011). This health risk has led to the development of an alternative to cigarette smoking for the delivery of nicotine (Lippi *et al*., 2013). The risks of these relatively new devices may be overlooked by their benefit of smoking cessation. Nicotine has been speculated to cause atherosclerosis and research (Lau *et al.,* 2005) shows long term exposure to nicotine resulted in increased aortic lesion size and production of cytokines in mice. Other research (Vansickel and Eissenberg, 2012) indicates that e-cigarettes can elevate nicotine concentrations in the blood to concentrations similar to regular cigarette use by an experienced user, and symptoms of nicotine withdrawal are reduced in abstaining users. Evidence from this research suggests the possibility that long term e-cigarette use may be a risk factor for atherosclerosis.

8

Title: Allelopathic Effects of Fresh Ground Coffee on the Growth of Tomato Plants

Presenter(s): Caci Lingen, Taylor Olson & Fernando Tabares

Advisor: Dr. Pam Sanders, Biology

Abstract: Adding coffee to the soil is a common practice among gardeners. This study tested effects of the allelochemicals of caffeine and other acids found in coffee by adding 0.0, 0.1, 0.5 and 1.0 grams of coffee to the soil of tomato (*Solanaceae lycopersicum*) plants. We hypothesized that higher amounts of fresh coffee grounds applied to the soil of tomato plants will decrease the shoot height and dry weight. Results showed there was no significant difference when comparing the average plant heights. The plants treated with 0.1 grams showed a 26% decrease in shoot weight. Increased quantities of coffee did not show a significant reduce shoot height and dry weight. In our experiment fresh coffee grounds neither helped nor harmed tomato plants.

9
Title: A model for amphetamine caused behavioral changes
Presenter(s): Alexis Walker
Advisor: Drs. Vaughn Gehle and Pam Sanders, Biology
Abstract: Low doses of amphetamine (AMPH) are currently used to treat ADHD and narcolepsy. Recreational use of AMPH is a much higher dosage and is associated with many serious side effects, including motor impairment, and addiction. Here I review two studies that show the motor impairment caused by high doses of AMPH and then look at the underlying mechanism of how AMPH causes these effects. Carvelli *et al.* (2010) shows that dopamine levels are linked with motor impairment and are indeed affected by AMPH levels. Ikegami *et al.* (2010) found an increase in the CCR2 protein in response to tolerance to AMPH. They further investigated the CCR2 gene and found an increase in H3K4me3, which is associated with an increase in transcription and mRNA. These experiments show that AMPH effects are associated with an increase in DA levels that could be caused by the methylation of H3K4.

10
Title: The effects of salt stressing on pea plants (*Pisum sativum*)
Presenter(s): Dylan Johnson, Mikaela Cypher, Nicole Cordes & Travis Radke
Advisor: Dr. Pam Sanders, Biology
Abstract: High salt concentrations are detrimental to plant height, while mild concentrations have been known to be beneficial. We hypothesized that mild concentrations of salt (NaCl) would cause pea plants (*Pisum sativum* "Strike") to retain water, resulting in an increased fresh weight, dry weight, and height of the plant. The pea plants were split into four treatment groups of 0mM, 125mM, 250mM, and 375mM NaCl solutions. Seedlings were watered when the soil appeared dry and height was measured about every four days. Dry weight was measured at harvest. Our preliminary results suggested that any amount of salt stress was harmful to plant health. Plant health was inversely related to salt concentration; as the salt concentration increased, the plant health decreased at a faster rate.

11
Title: Seasonal Evaluation of Camden State Park's Prairie Pothole
Presenter(s): Mikeal Cooper
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: A wetland is an area with mostly wet soil, saturated with water above or slightly below the surface, and populated by plants and animals adapted to wet conditions. Wetlands are important because they are hosts to a large variety of life. The objective of this study was to monitor the seasonal changes in a restored Prairie Pothole wetland at Camden State Park, near Marshall, MN. Water quality was measured biweekly from September 9 through October 28 using LaMotte test kits. It was expected that the water quality of the wetland would change, and the vegetation in the wetland would be native. Only water temperature, water height and dissolved oxygen showed a large change. Alkalinity and pH of the water concurrently exhibited minor changes. Vegetation was abundant, dominated by narrow-leaved cattails. There was a lack of animals present in the area, which likely correlates with the lack of nutrients found in the water.

12
Title: The Effects of Brain Trauma on the Vestibular Nerve
Presenter(s): Ben Tonsager
Advisor: Drs. Sandy Craner and Pam Sanders, Biology
Abstract: Mild traumatic brain injuries are an increasing problem in the United States. Vestibular symptoms are among the most common and hazardous side effects. This review describes the effects and possible cause of brain trauma on the vestibular nerve. Davies and Luxon (1995) examined the records of 100 patients to explore the neuro-otological basis for their symptoms. Their results concluded that all patients who had moderate to severe head trauma experienced a form of vestibular damage. According to Alhilali *et al*. (2014) damage to the central axon (white matter) is a likely cause of this vestibular nerve damage. It is safe to conclude that traumatic brain injury may have a negative effect on the vestibular nerve, through damage to the white matter.

13
Title: Potential of S100B as a Diagnostic Biomarker for Schizophrenia
Presenter(s): John Craig
Advisor: Drs. Vaughn Gehle and Pam Sanders, Biology
Abstract: Current diagnostic procedures for psychiatric conditions are largely subjective and based on an interview format. Recently, techniques have been developed to objectify diagnoses and tailor treatments on a more patient-specific basis. One such advancement is the use of the peripheral biomarker S100B, a glial protein expressed by

astrocytes in the brain, to allow for a more consistent and precise approach in diagnosing schizophrenia based on serum S100B levels. Here I review two studies on the efficacy of S100B as a biomarker for schizophrenia. Zhang *et al.* (2010) show a strong positive correlation between S100B levels and patients with schizophrenia as compared with normal controls. Steiner *et al.* (2009) conclude that S100B production is affected by adipocytes, and that body mass index may therefore be a confounding factor in the results of Zhang's study. Together, these studies demonstrate the diagnostic potential of S100B, while addressing important caveats to its use.

14

Title: Seasonal Study of Good Medicine WMA Wetland in Ghent, MN
Presenter(s): Colter Fortenberry
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: Wetlands are transitional areas between aquatic systems and upland terrestrial lands. The quality of water in a wetland is affected by soil type, vegetation, and climate. The aim of this study was to measure the water quality of the Good Medicine WMA wetland in Lyon County, Minnesota every other week for a ten week period from September 4th -October 30th,2014. As expected, water temperature decreased over time and dissolved oxygen increased slightly. There was no measurable nitrate or phosphate and other parameters did not vary significantly. Minnesota experienced an unusually warm and extended fall season, so it is not too surprising to see so few seasonal changes within the wetland. Very few of the parameters showed a significant change during the study except dissolved oxygen and temperature.

15

Title: Effects of Resveratrol on Response to Exercise Training on Selectively Bred Rats
Presenter(s): Theresa Ehnert
Advisor: Dr. Pam Sanders, Biology
Abstract: Resveratrol, an antioxidant in wines, is known to improve health. Obesity and cardiovascular health was improved in resveratrol-treated rats. However, in humans, resveratrol has not been consistently beneficial. I compared two studies by Hart *et al.* (2013a, 2013b), who studied the effects of resveratrol on exercise training with two breeds of rats, low and high capacity runners. Daily resveratrol supplementation (100mg/kg, orally) and exercise training was assessed on a treadmill. Maximal oxygen uptake was measured using sensors while the number of mitochondria was estimated by the amount of mitochondrial DNA in the gastrocnemius muscle. The results showed that in addition to regular exercise training, resveratrol enhanced maximal oxygen uptake and mitochondrial DNA in the high capacity runners. The low capacity runners gained less benefit from exercise training and resveratrol did not enhance the effects of the training. This rat model can help direct scientists towards making resveratrol beneficial to humans.

16

Title: The Effects of Saffron's Carotenoids on Prostate Cancer and Proposed Mechanisms
Presenter(s): Luke Stadther
Advisor: Dr. Pam Sanders, Biology
Abstract: 1 in 7 men are diagnosed with and about 1 in 36 die from prostate cancer. Studies have shown carotenoids have anti-carcinogenic properties. Crocin, a carotenoid in saffron, shows anti-carcinogenic activity. In this study I researched two articles to determine if saffron has an effect on prostate cancer. The first article investigated anti-carcinogenic effects of saffron extract (SE) and crocin (CR) on 7 prostate cancer cell lines (PCCLs). Analyses were used to determine effects of the extracts. Data showed that both reduced cell proliferation in 5 malignant PCCLs, but had no effect on 2 non-malignant PCCLs (D'Alessandro, 2013). The second article studied the effects of SE, CR, and crocetin (CCT) on PC3 and 22rv1, two aggressive PCCLs. They found that all extracts inhibited invasion and migration of cancer cells, but CCT had the more prolific anti-carcinogenic activity (Festuccia, 2014). These articles showed the positive impact phytochemicals have on prostate cancer.

17

Title: Investigation of Seasonal Changes in the Independence Park Wetland
Presenter(s): Samantha Ritter
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: Wetlands are valuable habitats that can improve water quality, remove pollutants, and provide habitats for many organisms. The type of wetland is determined by the vegetation, soil and hydrologic activities. The Independence Park wetland in Marshall, MN is a 5.82 acre wetland dominated by emergent vegetation and classified as a Type 5 shallow pond. Temperature, dissolved oxygen, alkalinity, pH, nitrate, and phosphate were measured every two weeks from September 3rd to October 29th, 2014 to evaluate seasonal changes. Temperature decreased over the weeks and dissolved oxygen and alkalinity increased. No changes in pH, nitrate, or phosphate were measured. Narrow-leaved cattail was the dominant

vegetation. Animals were sparse with a few sightings of barn swallows, dragonflies, and leopard frogs. Human impact by the use of playground equipment, paved paths, and picnic areas may contribute pollutants and litter to the wetland.

18
Title: Current and Prospective Treatments for Duchenne Muscular Dystrophy
Presenter(s): Travis Larson
Advisor: Drs. Sandy Craner and Pam Sanders, Biology
Abstract: Duchenne muscular dystrophy is a recessive x-linked disorder, usually caused by mutations of the dystrophin gene, that affects skeletal and cardiac muscle primarily in males. The disease leads to muscular, respiratory, and cardiac problems with death usually in late teens or early twenties. This review of two studies–shows current and prospective treatments for this disease. Biggar *et al.* (2006) show that the current steroid treatment of deflazacort can help briefly prolong life and onset of symptoms, but has numerous side effects and is not a cure. Lu *et al.* (2004) describe a prospective treatment of injecting antisense oligonucleotides to skip the mutated exon and restore dystrophin expression. They show that dystrophin-positive fibers in skeletal muscle increase with no adverse side effects, but no improvement in cardiac muscle. These experiments show the current and future states of treating Duchenne muscular dystrophy.

19
Title: Comparison of Olympic Weightlifting versus Powerlifting in Collegiate Football Players
Presenter(s): Caleb A. Heim
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: The purpose of this investigation was to compare and analyze gains in strength and power between two strength and conditioning programs. Thirty-two collegiate football players participated in this study and were divided into two groups. Each group completed 5 weeks of training using either powerlifting or Olympic-style weight lifting for their core lifting regimen. Each group was taught proper technique and experienced similar intensities by using auto-regulatory progressive resistance exercise protocols. Both groups performed similar warm ups, mobility exercises, auxiliary exercises, core strengthening exercises, and stretches. Maximal strength was measured before and after training using 1-repetition maximum for the Squat, Bench Press, and Deadlift. Hang-Clean was tested with 3-repetition maximum and converted to estimated 1-repetition maximum. Maximal force production was measured with vertical jump, broad jump, and medicine-ball throw tests. Muscular endurance was measured with a push-up test. At the time of abstract submission, post-testing results had not been collected.

20
Title: Gut Microbiota Production of Short-chain Fatty Acids and Their Influence on Obesity via the G-protein Receptor 41 pathway
Presenter(s): Claire Sames
Advisor: Drs. Tony Greenfield and Pam Sanders, Biology
Abstract: The worldwide obesity epidemic is stimulating efforts to identify host and environmental factors that affect energy balance. Recently, obesity has been linked to the composition of human gut microbiota and their production of short-chain fatty acids (SCFAs). Schwiertz *et al*., (2009) analyzed fecal samples of lean, overweight, and obese individuals and found that overweight and obese individuals had higher fecal concentrations of propionate and total SCFAs compared to their lean counterparts. Furthermore, Samuel *et al*., (2008) examined the effects SCFAs had on obesity via the Gpr41 pathway in mice. Results indicated that propionate activated the Gpr41 pathway, which caused the production of peptide YY, a hormone that inhibits gut motility thus allowing more energy to be extracted from food. These studies indicate that obesity may be linked to the gut microbial SCFA production and their cross communication of the Gpr41 pathway.

21
Title: Ecological Observations of AmericInn Wetland in Marshall MN
Presenter(s): Devin Ryan
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: Wetlands are the link between land and water, and are some of the most productive ecosystems in the world. Observing the ecological changes in a wetland is essential for understanding how seasonal changes affect the environment. The wetland studied is the AmericInn, a Type 3 shallow marsh wetland in Marshall, MN. Water quality (dissolved oxygen, alkalinity, nitrate, phosphate, and pH) was measured using LaMotte test kits every other week for nine weeks, September through October 2014. Vegetation and organisms were documented for the same nine weeks. The wetland was anoxic initially but oxygen increased to 5.8 mg/L in week 2, which coincided with much more aquatic macroinvertebrate activity. Despite the lack of measurable dissolved oxygen initially, the wetland had typical plants and aquatic insects present. Wetlands are important systems to our environment

and understanding these seasonal changes contributes to our knowledge of how wetlands affect the environment.

22

Title: Binding Properties of Hemocyanin which allow for Transitions Up and Down the Water Column

Presenter(s): Joe Christensen

Advisor: Drs. Pam Sanders and Betsy Desy, Biology

Abstract: Hemocyanin is an oxygen-binding molecule found in some organisms. Oxygen binds to copper in hemocyanin as opposed to oxygen binding to iron in hemoglobin. This copper-oxygen bond forms more readily than the iron-oxygen bond. This allows for binding in lower partial pressures of oxygen and it allows organisms to move vertically through the water column. The jumbo squid is a large predator that hunts in the upper water column at night and deep water during the day (Seibel, 2013). This daily migration through the water column stresses the squid's respiratory system. Many variables, particularly temperature, pH, and PO2, are important as an animal moves up and down the water column. All three can change critically throughout the water column. Most critically is the PO_2. The Bohr and Haldane Effects are both important factors that contribute to oxygen uptake and dispersal as well as carbon dioxide removal (Brix *et al*., 1981).

23

Title: Comparing the effects of salt stress on lentils and corn

Presenter(s): Emily Heesch, Paul Schell & Kate Nohner

Advisor: Dr. Pam Sanders, Biology

Abstract: Salt is a common byproduct of irrigation systems and salt stress is detrimental to agricultural growth. We hypothesized that corn (*Zea mays*) would have a higher dry weight and height than lentils (*Lens culinaras*) under salt stress because corn has larger, stronger roots that assist in adapting to environmental stressors more than the roots of lentils. For 4 weeks, 5 plants of each species were exposed to a gradual increase in salt stress starting at 50mM NaCl and reaching 200mM NaCl, and 5 plants of each species were exposed to tap water. Heights were measured biweekly and dry weights were taken. Salt stress inhibited lentil growth significantly more than corn growth, with several lentils dying and corn continuing to increase in height.

24

Title: Preliminary Screening of Lipid Productivity in Algae for Biofuel Use

Presenter(s): Rebecca Sommer, Claire Anderson & Pam Sanders

Advisor: Dr. Pam Sanders, Biology

Abstract: Renewable energy sources are being sought to replace diminishing fossil fuels. Biofuel from algae lipids are being developed as a sustainable alternative. Researchers are screening algae species for maximal production of lipids with desirable biofuel traits. We developed preliminary methods to screen four algae species. In two trials, *Selenastrum capricornatum, Scenedesmus sp., Chlamydomonas reinhardtii* and *Chlorella vulgaris* were grown under fluorescent lights in flasks of Bristol's media (pH 5.5-7.0) or Alga-Gro media (pH 6.5-9.0). Algae growth was estimated by Absorbance using a spectrophotometer. Optimal wavelength for each species was determined by absorption spectra. Lipid production (% dry weight) was determined by harvesting algae through centrifugation and extracting lipids with 2:1 chloroform:methanol. The weight of extracted lipids was too small to measure in this preliminary experiment. Our culture methods need improvement to produce greater quantities for analysis. However, researchers with established techniques are making progress developing the potential of algae biofuel.

25

Title: Evaluation of Ecological Changes in the SMSU Event Center Wetland during fall 2014

Presenter(s): Caci Lingen

Advisor: Dr. Emily Deaver, Environmental Science

Abstract: Wetlands serve as important habitats for a variety of plants and animals. Observations of local wetlands can provide information about the type of wetlands present and the functioning of the ecosystem. Ecological observations, water quality measurements, and changes in water depth were measured biweekly in the SMSU Event Center wetland from September 3 to October 28, 2014. Vegetation and animals were also identified. The wetland was determined to be a Type 5 shallow open water community. Results showed that both air and water temperatures decreased over time and dissolved oxygen increased with declining temperatures. Cattails were the dominant vegetation and showed a change in color over time. Crayfish and Northern Leopard frog activity declined with cooling temperatures. Wetland changes verified that changing seasons affects the ecosystem.

26
Title: Impacts of Cover Crops and Tillage Management on Soil Quality in Southern Illinois
Presenter(s): Samantha Ritter
Advisor: Dr. Jon E. Schoonover, Dept. of Forestry, Southern Illinois University Carbondale (SIUC)
Abstract: Agriculturalists disturb the soil and nearby environment, but by practicing management methods, like cover crop and no-till, environmental impacts can be reduced. In this study, aggregate stability, infiltration, earthworm biomass and density, bulk density, and penetration resistance were measured on twelve plots located on a 14.5 acre soybean field in Southern Illinois. Treatment groups consisted of three replicates of no-till with cover crops, no-till without cover crops, tilled with cover crops, and tilled without cover crop plots. Significantly higher earthworm abundance was found in no-till with cover crop plots compared to tilled with cover crop plots. No other significant differences were observed. Since this was the first year practicing cover crop and no-till treatment, more differences are expected to develop between treatments overtime.

27
Title: Evaluation of Biological and Chemical Changes in a Freshwater Marsh near Marshall, MN
Presenter(s): Casey Field
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: There are over 10 million acres of wetlands in Minnesota. A Type 4 Deep Water Marsh mitigation wetland located in southwest part of section 32 in Fairview Township in Lyon County was monitored. The wetland was measured for changes in water depth, water temperature, dissolved oxygen, alkalinity, pH, phosphorus, and nitrogen levels. Physical changes of plant and animal life was monitored. These levels were measured once every two weeks starting on September 5th and ended on October 31st, 2014. Water depth dropped 46cm, temperature dropped 10 degrees Celsius, dissolved oxygen raised 4.5 mg/l, alkalinity raised 20 ppm, pH stayed constant, as did phosphorus and nitrogen levels. Cattails turned from green to brown and duck population went from 30-40 to none present. The drop in air temperature is believed to be the cause of the wetland changes.

28
Title: Evaluation of Temporal Ecological Changes in a Shallow Open Water Community near Marshall, MN
Presenter(s): Josh Hughes
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: Wetlands are unique aquatic environments that serve as vital habitat for many different organisms and offer ecological benefits such as natural water filtering. Seasonal changes can drastically alter wetland traits and processes and thus significantly affect the organisms living there. A shallow open water wetland located in Marshall, MN was observed to document changes in biotic and abiotic components over time. The study site was observed every two weeks during September and October 2014. Over the duration of the study period 10 types of vegetation and 7 types of invertebrate/vertebrates were observed. Dominant vegetation was narrow leaved cattail (*Typha angustifolia*); relative abundance of vegetation did not significantly change during the study period. Water depth decreased by nearly 50% and standing water area decreased by 65% during the course of the study. Dissolved oxygen increased corresponding with a decrease in water temperature. Data suggests that seasonal changes within this wetland were minimal.

29
Title: Differences in health and skill related physical measurements between forwards and backs on the SMSU Men's Rugby team
Presenter(s): Dustin Schulte
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: Rugby players use all three energy systems during a rugby match. This study sought to determine the differences in health- and skill-related physical fitness measurements between forwards and backs in a regional American university club program. Twenty subjects aged 20.90±1.93 performed 7 fitness tests including power, speed, agility, strength, aerobic power, muscular endurance, and reaction time. Forwards compared to backs were different in body mass (103.88±14.82 vs. 80.99±13.13 kg, p=0.002) and BMI (31.65±3.41 vs. 26.30±4.66 kg/m^2, p=0.009). Therefore, strength was analyzed based upon weight lifted normalized by body mass. There were no differences between forwards and backs in strength, muscular endurance, and reaction time. There were significant differences in speed (5.78±.32 vs 5.33±.23 seconds, p=0.002), agility (10.41±.64 vs. 9.73±.76 seconds, p=0.046), VO_2max (34.82±4.91 vs. 42.53±7.05 ml/kg/min, p=0.011) and power (1542.20±391.17 vs. 1232.10±221.51 Watts, p=0.043) between forwards and backs. The results indicate variable fitness abilities by rugby playing position.

30
Title: Plyometric Hopping Exercise to Improve Agility
Presenter(s): William Lato
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: Agility requires change of direction during running with deceleration phase, plant phase, and rapid re-acceleration phase. Plyometric exercise is known to improve the time delay between these three phases. This study sought to examine the effect of plyometric training on agility in females aged 21.25 ± 1.2 years. Three non-athlete women completed multiple trials of 3 common agility tests before and after 4 weeks of plyometric training and were compared to 5 controls that completed pre and post testing without training. At baseline, subjects in the training and control groups were similar for the Pro-agility (5.8 ± 0.5 vs. 6.2 ± 0.4 seconds, p = 0.29), T-test (13.1 ± 1.0 vs. 13.8 ± 0.6 seconds, p = 0.29), and Illinois agility test (15.1 ± 2.8 vs. 14.7 ± 1.2 seconds, p = 0.84). At the time of this abstract submission, training and post-testing were not complete.

31
Title: Seasonal Observations of a Neighborhood Wetland in Marshall, MN
Presenter(s): Catarina Gronau
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: Wetlands are important ecosystems that provide housing, nesting, protection, and food to many organisms. These wetlands are exposed to changes as seasons change. These changes were observed and measured on 4 dates in September and October, 2014 in a wetland at the intersection of Saratoga Street and Highway 23 in Marshall, MN. Water quality (dissolved oxygen, alkalinity, nitrate, phosphate, pH, water and air temperature) was measured using LaMotte Test Kits and a thermometer. As time went on, air and water temperatures dropped and dissolved oxygen increased. Plant and animal species and their relative abundance were recorded from observations. First sample date vegetation was green and abundant compared to the last sample date vegetation which were brown and dying. Results showed that the changes to these observations were due to the seasonal change and human impact around the wetland.

32
Title: Seasonal Changes in Dovray WMA Type 4 Wetland
Presenter(s): Travis Radke
Advisor: Dr. Emily Deaver, Environmental Science
Abstract: Wetlands have a positive effect on the ecosystem, they not only provide habitat for animals, but also have the ability to clean water, recharge the ground water, act as a sink for nutrients, and provide recreational areas. Dovray WMA Wetland near Dovray, MN is classified as a Type 4 deep marsh wetland. Water quality measurements were taken every other week from September 8th through October 20th, 2014 using LaMotte test kits to document any seasonal changes within the wetland. As air temperature dropped the water temperature dropped as well, and the dissolved oxygen levels increased. Vegetation surrounded the entire wetland consisting mainly of narrow-leaved cattails. Plant species were observed and recorded within the wetland. These results show wetlands seasonally change affecting the plant and animal life within the wetland.

33
Title: Increasing the speed of a wheelchair athlete
Presenter(s): Chelsea Robinson, Ashley Slyter & Dillan Hutchins
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: Wheelchair athletes rely heavily on aerobic and anaerobic power. In wheelchair basketball, 28% of games are spent using anaerobically-derived energy and 22% of the game is played above the ventilatory threshold. A six-week study was conducted to determine whether wheelchair specific speed and agility is improved through resistance training and conditioning. Athletes were tested before and after training via a sprint test, agility test, and measurements of muscular strength and power. Additional sprint-speed and agility testing was performed mid-program. In a 22.9 meter sprint, subjects were significantly faster during the mid-test compared to pre-season testing (6.32±0.47 vs 6.65±0.47 seconds, $p<0.001$) Additionally, subjects were faster mid-season compared to pre-season in a wheelchair-based cone agility test (17.21±1.15 vs 18.56±1.68 seconds, $p=0.002$) At the time of abstract submission, all training and testing was not complete. However, these findings indicate that a comprehensive training program is effective in improving wheelchair specific speed and agility.

34
Title: The Use of Fertilizer to Combat Allelopathic Effects of Garlic Mustard on Tomatoes
Presenter(s): Megan Bruns, Austin LaFollette & Rhiannon Sears
Advisor: Dr. Pam Sanders, Biology
Abstract: Garlic mustard (*Alliraria petiolata*) is an invasive plant found throughout most woodlands of the United States, its success corresponds with the allelopathic chemicals it uses to inhibit the other

plants around it. We hypothesize that we can use fertilizer as a mechanism to overcome the inhibitory effects of garlic mustard on tomato (*Solanum lycopersicum*) plant height, root length, and dry weight. We bare-root transplanted 24 tomato seedlings into glass jars containing one of four half-strength Hoagland nutrient and garlic mustard solutions: 123 ppm N (control), 123 ppm N + GM, 185 ppm N + GM, 308 ppm N + GM. Plant height and root length were recorded every 5 days for 25 days. Dry weights were recorded after 25 days. Treatment groups showed an average of 96.8% less carbon matter when compared to the control. Our results suggest that fertilizer cannot overcome the inhibitory effects of garlic mustard.

35

Title: Do high heels brand high strength?
Presenter(s): Rebecca Suter
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: Forty-nine percent of females, 18 years or older, regularly wear high heels. Half of the women in the United States wear high heels for appearance reasons. It is possible that wearing high heels may change calf strength, muscular endurance, balance, and range of motion in the lower extremities although the research is scant regarding this style of footwear. Therefore, this study was designed to measure those variables in high heel versus non high heel wearers. In a timed standing balance test, high heel compared non high heel wearers had worsened balance in the right foot test (99.80 ± 24.75 vs. 273.92 ± 174.72 seconds, $p < 0.05$) and a trend for worsened balance in the left foot test (109.20 ± 28.10 vs. 281.25 ± 210.73 seconds, $p = 0.09$). Calf strength, muscular endurance, and range of motion were similar between groups.

36

Title: Functional Movement Screening in Active and Sedentary Men and Women
Presenter(s): Kaley Scearcy & Megan Evert
Advisor: Jeffrey W. Bell, Ph.D and Kris Cleveland, D.P.T., Exercise Science
Abstract: Recently, the Functional Movement Screen (FMS) has gained popularity to detect injury likelihood based upon deficiencies in movement patterns. The goal of this 2x2 study was to assess movement patterns in men and women who are physically active or sedentary. The FMS test has 7 different movement patterns including deep squat, hurdle step, inline lunge, shoulder mobility, trunk stability, straight-leg raise and rotary stability. Each component is scored 0-3 with a maximum of 21. Thirty-two college-aged subjects (17 men, 15 women) completed all 7 tests. There was not a significant main effect of physical activity or sex on FMS total scores ($p=0.60$). Investigating the individual components, there were no differences in any tests between sedentary and active participants. However, there were differences between men and women for trunk stability ($\chi^2=12.7$, $p<0.01$) and inline lunge ($\chi^2=8.1$, $p<0.05$). There may be unique movement deficiencies between men and women that deserve further investigation.

37

Title: Case Study: Ankle-brachial index in Postural Orthostatic Tachycardia Syndrome (POTS)
Presenter(s): Annette T. Carr, Ashley Timm & Morgan Darner
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: This study was conducted to determine effects of acute exercise on heart-rate and blood pressure in a case subject (CS) who has been diagnosed with Postural Orthostatic Tachycardia Syndrome (POTS). Due to the altered sympathetic nervous system function, heart-rate and blood-pressure responses were measured before and after upper-body and lower-body exercise. Twelve similarly aged controls (CON) were studied for comparison. Clinical criteria for POTS include sustained heart-rate increase of ≥ 30 beats per minute within 10 minutes of standing. After 5 minutes of standing, CS heart-rate increased from 83 to 114 bpm whereas CON heart rate increased from 75.83±12.15 to 90.58±10.48. Resting ankle-brachial index (ABI) in POTS compared to CON was lower (0.94 vs 1.08±0.08). Post-arm cycling ABI was higher (1.27 vs. 1.04±0.10) as was post-leg cycling (1.25 vs. 0.98±0.10). Therefore, acute exercise can increase ABI when sympathetic nervous function is compromised, but may decrease ABI when sympathetics function properly.

38

Title: Improving Balance through Exercise Prescription
Presenter(s): Ashley Daniels, Holly Erickson & Emily Klima
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: Balance predicts success in activities of daily living and decreases with age. Performing balance exercises may improve balance. The purpose of this study was to determine whether older individuals (72.22 ±8.67) compared to college-aged (21.56 ±1.95) responded to balance training similarly. Nine older and 9 younger subjects were pre-tested, given a four-week exercise prescription, and post-tested after prescription completion. The testing consisted of the Y-balance test, Meter Stick

test, and timed balance on each leg. During pre-testing older compared to younger subjects performed worse on Y-balance testing for left (73.2±12.09 vs. 94.17±4.69 cm, $p<0.01$) and right (74.56±10.48 vs. 92.32±6.38 cm, $p<0.01$) legs. Older subjects also performed worse on a reaching test (30.48±9.88 vs. 43.18±3.30 cm, $p<0.01$) and a timed single leg balance test on the left (5.39±2.98 vs. 74.22±94.07 seconds, $p<0.05$) and right (6.17±5.84 vs. 78.11±95.16 seconds, $p<0.05$). Training and post-testing wasn't complete at the time of the abstract submission.

39

Title: The allelopathic effect of sorghum residue on the germination, emergence, and growth of waterhemp seeds

Presenter(s): Casey Hertz, Steven Rohlik, Alan Zimmerli & Morgan Weyer-Coates

Advisor: Dr. Pam Sanders, Biology

Abstract: Allelopathic chemicals have the ability to reduce germination rates and overall growth in plants. We predicted that increased sorghum leaf extract concentrations will reduce germination of waterhemp (*Amaranthus tuberculatus*), okra (*Abelmoschus esculentus*), and barley (*Hordeum vulgare*) seeds. Seeds of these plants were placed in petri dishes containing filter paper. Seeds were kept in SM 166 Southwest Minnesota State University at 68°F, under an inflorescent light source. Each type of seed had trials with concentrations of sorghum extract at 0g/1L, 20g/1L, and 40g/1L. Seeds were checked after 2 weeks to determine germination. Control waterhemp germination was 58%, seeds of the 20g/1L solution germinated at 56%, and seeds of the 40g/1L solution germinated at 50%. Results for the okra and barley trials are yet to be determined. Our results indicate that increasing concentrations of sorghum extract can reduce germination of waterhemp seeds.

40

Title: The Effects of Caffeine on the Body

Presenter(s): Erica Downing, Katie Erickson & Tara Quast

Advisor: Jeffrey W. Bell, Ph.D, Exercise Science

Abstract: Many people consume the stimulant caffeine daily using it to enhance energy levels. Recently, popular fitness literature has suggested that removing caffeine from the diet and then returning to a caffeine regimen can enhance exercise performance. Therefore, this study sought to determine any differences in heart rate, blood pressure, reaction time, memory, and agility when caffeine is removed from and returned to the diet. Seventeen regular caffeine users, age 18-61, were recruited. After pre-testing, subjects removed caffeine from their diet for 1 week, returning to their normal diet for a second week. Reaction time measured with a yard-stick drop, memory was tested via recall percentage out of twenty random items, and agility was tested with two different ladder tests run for time. There were no significant differences between conditions for any of the variables tested. This suggests that physical benefits of consuming caffeine may be of limited value.

41

Title: Seasonal Ecological Observations of the *Sleep Inn* Wetland in Marshall, MN

Presenter(s): Courtney Lingen

Advisor: Dr. Emily Deaver, Environmental Science

Abstract: Wetlands are valuable habitats because they act as sources/sinks for nutrients, recharge/discharge groundwater, and are retention ponds for water and pollutants. The purpose of this research was to monitor seasonal changes in water quality and surrounding habitat of the Sleep Inn wetland in Marshall, MN. Plant and animal species were identified. Water depth was monitored using a fixed point on a stationary pole in the wetland, and water temperatures were measured with a thermometer. LaMotte tests for Nitrate, Phosphate, Alkalinity, Dissolved Oxygen, and Precision pH were used every two weeks from September 3 to October 28, 2014. Narrow-leaved cattails and leopard frogs were the most abundant species identified. Phosphate and nitrate stayed at 0 mg/l. A drop in water temperature resulted in an increase in dissolved oxygen. Alkalinity stayed relatively constant ranging from 108 to 116 mg/L of $CaCO_3$. Results showed seasonal changes were observed in the Sleep Inn wetland.

42

Title: Amphetamine causes trans-generation behaviors by inducing epigenetic modifications

Presenter(s): Alexis Walker, Bryan Safratowich, Murad Hossain, and Lucia Carvelli

Advisor: Dr. Lucia Carvelli, Pharmacology, Physiology, and Therapeutics, University of North Dakota School of Medicine and Health Science

Abstract: Amphetamine is a psychostimulant which can cause addictions. Inheritance of acquired traits, like addiction, is termed "epigenetics". We studied the trans-generational effects of amphetamine in the nematode *C.elegans*. We treated *C.elegans* embryos with amphetamine for 15 hours. Animals were grown to the adult stage and then tested for swimming induced paralysis (SWIP). We found that animals chronically treated with amphetamine during development exhibited higher SWIP than the

controls. Interestingly, progenies derived from chronically treated animals also exhibited higher amphetamine-induced SWIP with respect to controls, suggesting that the effects induced by amphetamine chronic treatment can be inherited. How these effects were inherited then became the focus of this study. Western blots were run to look for epigenetic modifications.. Tri-methylation of lysine 4 on histone 3 (H3K4me3) was shown to be greater in animals treated with amphetamine. The methylation of this histone could, therefore, explain the ability for addictions to be inherited.

43
Title: Forced Eccentric Contractions on Gastrocnemius and Soleus Hypertrophy
Presenter(s): Samuel VanNevel
Advisor: Jeffrey W. Bell, Ph.D, Exercise Science
Abstract: For the sport of bodybuilding, muscular-hypertrophy is the primary goal. Eccentric training is gaining in popularity as it may increase muscle size more rapidly than concentric training. Each subject performed eccentric training (ET) with one leg and concentric training (CT) with the contralateral leg. Whether subjects trained their dominant or non-dominant leg eccentrically was randomized. Each subject performed 3 sets of 10 repetitions for CT at 70% 1RM and 3 sets of 5 repetitions at 110% 1RM for ET. Circumference was measured at the soleus and gastroc-nemius at the areas of widest girth and normalized to fat-free circumference. Before training, the ET and CT gastroc nemius were similar (33.10±1.12 vs. 32.90±1.17cm, p=0.09) and the ET and CT soleus were similar (27.42±0.54 vs. 26.86±0.71cm, p=0.182). After training, the ET gastroc-nemius increased girth by 0.60 cm (p=0.05) but the CT gastroc-nemius did not change. There were no soleus muscle training-induced changes.

Poster Session B –
Agronomy, Computer Science, History, Political Science, & Sociology

44
Title: Effects of AVAIL® Treatments on Height and Dry Weight of a Field Corn
Presenter(s): Casey Field
Advisor: Lee French, Agronomy
Abstract: Phosphorus is an essential element classified as a macronutrient because of the relatively large amounts of phosphorus required by plants. It is estimated that less than 25% of phosphorus applied to soil is plant available. I hypothesized that soil treated with AVAIL®, a phosphorus fertilizer enhancer, would produce taller plants and higher dry weight. A total of 64 corn plants in 16 pots were set up in three test groups: high treatment: 4ml, recommended treatment: 2ml, low treatment: 1ml, and one control of no treatment. Plants were planted in soil with nutrient amendments to mimic natural field soils, and grown in the SMSU greenhouse. Height measurements were taken twice a week starting on March 28th and ending on April 25th, 2014. The control had the highest shoot dry weight, root dry weight and had the tallest plants.

45
Title: The Allelopathic Effects of Coffee Grounds and Extracts on Field Peas
Presenter(s): Brad Hipsag
Advisor: Lee French, Agronomy
Abstract: Allelopathy is the chemical effect a plant has on another plant. Caffeine has shown a negative allopathic effect on plants. We hypothesized that high levels of caffeine will inhibit the growth of *Pisum sativum*. We compared two application methods on 25 field pea plants: caffeine vs. decaf extracts (87.82 g/L) and caffeine vs. decaf grounds (1:1 coffee:soil). Plant height was measured twice per week for 4 weeks and dry weights were determined. Plants given coffee grounds in the soil died within 5 days. Plants given decaffeinated extract grew 7 cm taller than caffeinated extract plants. Growths of both extracts were 57% shorter than the control. Dry weight of extracts and grounds were 77-95% lighter than the control. Caffeinated coffee could be a reasonable herbicide if it is mixed in the soil at a high rate, but could be expensive.

46
Title: The Effect of Snow Cover on Corn Planted at Different Depths
Presenter(s): Thomas Sandt
Advisor: Lee French, Agronomy
Abstract: This experiment was undertaken to determine the effect snow cover has on Zea maize planted at different depths. Twenty-four plants were split into six different test groups. Three control groups planted at a depth of 1", 2" and 3" were placed in the greenhouse and watered as needed. The test group consisted of the same depths, but were placed in a growth chamber and covered with snow for two weeks. After the two weeks, the plants were brought into the greenhouse and watered as needed. In the beginning, germination rates were analyzed, and later plant stage and height were recorded. After 40 days, dry weights were taken.

Compared to the control, the snow treated groups germination rate, stage, plant height, and dry weights were all hindered. Results showed that planting deeper before a snow had a slightly more positive effect.

47
Title: Effects of Glyphosate on Tall Waterhemp (*Amaranthus tuberculatus*)
Presenter(s): Ryan Palmer
Advisor: Lee French, Agronomy
Abstract: Tall Waterhemp is a hardy weed that has caused much annoyance in many agricultural fields in the Corn Belt area. Our farm is also included with these problem areas. I have noticed that the Waterhemp plants have begun to resist certain chemicals like Glyphosate based Round-Up. With these observations, I have come to believe that when Waterhemp plants have weak amounts of Glyphosate applied, the seeds from that plant will become Glyphosate resistant. With failed attempts in the SMSU greenhouse, I had to carry my experiment into the summer. I also was able to locate a population of Waterhemp plants in a field to use for comparison to the plants grown in pots. The results from the experiment both prove and disprove my hypothesis and are a beginning to many other hypotheses that could be tested.

48
Title: State and Federal Responses to Invasive Species in Minnesota
Presenter(s): Paige Swenson
Advisor: Dr. David Sturrock, Political Science
Abstract: Recent studies by both state and federal organizations have found that invasive species are increasing in population and spreading throughout lakes and other water bodies in Minnesota. This paper analyzes the different ways invasive species have negative effects on Minnesota water bodies. Also researched are the organizations making efforts in stopping the spread and decreasing effects on the environment. Several of these organizations have a role in what legislation is being discussed and ultimately passed into law, in order to aid in the minimization and elimination efforts.

49
Title: Rail Car Shortage in Minnesota
Presenter(s): Teather Lacy
Advisor: Dr. David Sturrock, Political
Abstract: The state of Minnesota is covered in fields of crops, deciduous forests, and a strong range of precious ore. All of these products play a vital role in the state of Minnesota's economy. Not only has Minnesota recently wrapped up a record harvest year, but the neighboring state of North Dakota is in the middle of a new found success with an oil boom. This combination has landed Minnesota in a transportation fiasco, particularly with the railroad. A shortage of railcars, the lack of employees, and infrastructure expansions still in development has created a sense of pressure on exports throughout all corners of the state from the fields of Southwest Minnesota to the banks of the Mississippi River to the shores of Lake Superior. This presentation will study just how much Minnesota's farmers and producers have felt the effects of the continuing railroad situation.

50
Title: Race and Gender Portrayed in the Media: A Content Analysis of Front Page and Local Crime Stories in the Minnesota Star Tribune
Presenter(s): Allison M. Bakken & Jessica Thelemann
Advisor: Dr. Kerry Livingston, Sociology
Abstract: A comparative content analysis conducted by Dixon and Linz (2000) found racial biases in the portrayal of criminals on local televised news. The goal of this class project was to analyze the content of crime stories in a widely circulated newspaper in Minnesota to determine if similar news coverage distortions exist. In addition to examining the race and ethnicity of both victims and perpetrators in local newspaper content, this study also considers gender portrayals in each of the articles analyzed. Our sample consisted of 79 crime stories that were published in the Minneapolis Star Tribune in 2013. Only stories from the front page and local section of each randomly selected newspaper were included in the analysis. Using many of the methodological strategies used by Dixon and Linz (2000), we compared victimization data and uniform crime statistics against the content of crime stories in the Minneapolis Star Tribune. Percentage point differentials were calculated to determine whether racial-ethnic and gender misrepresentations were present in the newspaper articles sampled.

51
Title: Cross Platform HTML5 Mario Style Game
Presenter(s): Sam Opdahl
Advisor: Drs. Daniel Kaiser, Kourosh Mortezapour, & Shushuang Man, Computer Science
Abstract: When creating a game, one of the considerations developers need to make is which platform they will develop the game for (Windows, Mac, Android, iOS, etc.). The goal of my project is to help solve this problem by using a new web technology called HTML5 to create a game that is completely cross platform and will work on almost

any device. HTML5 allows the game to be played right in any modern web browser without any third party plugins, such as Flash or Java. This means the consumer can visit a webpage, and the game will be playable instantly, no installation required. In order to take advantage of HTML5, I decided to create a 2D game similar to the old Mario games. The game can be played using keyboard controls on computers, and touch controls on mobile devices.

52
Title: Java Decompiler
Presenter(s): Andrew Kruse & Gene (Randy) Briest
Advisor: Dr. Daniel J. Kaiser, Computer Science
Abstract: In order for a program to be moved from source code to an actual running application, it needs to be compiled, or translated to a language the computer can understand. What a decompiler does is take an application that can be executed on your computer and turn it back into source code the programmer can read. The Java programming language (.java file) gets compiled into two different files, .class files and .jar files. The source code that programmers write is saved in a .java file. The java decompiler we are programming takes a .class file and turns it back into a .java file.

53
Title: QR Tag
Presenter(s): Duncan Sullivan
Advisor: Dr. Daniel J. Kaiser, Computer Science
Abstract: QR Tag is a game I came up with when thinking of ways to tag people without having to be physically close to them. It stemmed off the idea of using clothespins to pin someone without being seen. Being on a college campus, you often see people you know without them seeing you, which makes these kinds of stealth tagging games fun. I've created a website at qrtag.comule.com where you can sign up to create and be a part of these games. Members are assigned a personal QR code. You set up or join a game, place this QR code on your person, and then try to scan other people's QR codes without being caught. You can use any QR code reading app for your mobile device to do so. Do you have what it takes to be a QR Tag champion?

54
Title: Fat Reducers in Process Cheese Spreads
Presenter(s): Jordan Rammelsberg
Advisor: Dr. Samir Amin, Culinology
Abstract: **WITHDRAWN**

55
Title: The effects of Pea Protein and Chia Flour on the Water Holding Capacity of Beaker Sausage
Presenter(s): Erik Hurley
Advisor: Dr. Samir Amin, Culinology
Abstract: **WITHDRAWN**

56
Title: Comparing the Physical Characteristics of Functional Ingredients in Gluten Free versus Conventional Pound Cake
Presenter(s): Skyler Kontio
Advisor: Dr. Samir Amin, Culinology
Abstract: WITHDRAWN

57
Title: Mustang Rentals
Presenter(s): Saugat Pradhan
Advisor: Dr. Daniel J. Kaiser, Computer Science
Abstract: Mustang Zone is a favorite hangout spot for the students and faculty alike where they can entertain themselves or spend their spare time. Mustang Zone provides the students and the staffs of SMSU with thousands of movie titles and games for different platforms such as Wii, PS4, and Xbox one. The Mustang Entertainment page is a webpage I thought about a long time ago ever since I started working at the student center. Through the webpage any students will be able to look up the availability of the movies and the games for rental. There are going to be reviews and ratings available to look at for the movies that are in the Mustang Zone. The webpage will be accessible through the SMSU website and hopefully be help for the customers who use the Mustang Zone regularly.

58
Title: Patient Management System
Presenter(s): Arnold Siyapche
Advisor: Drs. Daniel Kaiser, Kourosh Mortezapour, & Shushuang Man, Computer Science
A**bstract**:Patient Management System is a Database application that allow: First, a Doctor, Nurse or Front-Desk assistant with appropriate privileges to login in their account to manage (create, update, delete, store and display) the patient data in a health facility. Second, a Patient to access via a website the files generated during their visits.

59
Title: Building an Android App Game
Presenter(s): Ying Kong Vue
Advisor: Drs. Daniel Kaiser, Kourosh Mortezapour, & Shushuang Man, Computer Science

Abstract: Android game apps are being developed constantly. I wanted to take a chance and get into what it's like to produce a game for android, and see the steps and process needed in doing so. The game that I will be creating will be a maze type game that uses the android device's accelerometer to control the character within the game. The game itself will consist of 4 characters and 9 levels for each character and each maze will have pickup items for scoring throughout each level. This project is designed in Marmalade Quick SDK and is coded in the programming language Lua.

60
Title: Small World
Presenter(s): Alex Kitzberger
Advisor: Dr. Daniel J. Kaiser, Computer Science
Abstract: Small World is a computer game that I am currently developing based on the board game Small World. The original game was designed by Philippe Keyaerts and published by Days of Wonder. In Small World both players pick a randomly paired race and special power and vie for conquest over territories. The game lasts for 10 rounds and whoever has the most victory points wins the game.

61
Title: Jeopardy Game
Presenter(s): Prajula Shrestha & Jordan Twachtmann
Advisor: Dr. Daniel J. Kaiser, Computer Science
Abstract: Jeopardy game designed to be used as a study tool for students to use before a quiz or exam. This project is created in two parts. The first part has the question bank where the user will enter a series of questions in different categories and the answers to the questions will be set up as well in the form of multiple choice while the second part is the game. The game is played between 2 to 6 players where they compete against each other answering questions relative to the course material. The player or team with the most points at the end of the game wins. We used PHP, HTML, and MySQL to create the project.

62
Title: Burning Box 3D Engine
Presenter(s): Tyler Thompson
Advisor: Dr. Daniel J. Kaiser, Computer Science
Abstract: The Burning Box 3D engine provides a framework for C++ programmers to easily create their own 3D scenes in realtime. It is written in C++, compiled into a library that can be easily imported into the end users' program, and makes heavy use of the OpenGL API. Essential operations, including continuous scene rendering and updating, window object handling, user input collection, and resource importing, are handled automatically by the engine. One major goal of the project has been to simplify and reduce the amount of code and effort needed from the end user. Features include PNG and BMP texture support, Wavefront OBJ mesh importing, post-processing effects via GLSL shaders, terrain and water generation, lighting and fog, and particle systems.

63
Title: Corruption of St. Paul Police and Newspapers During the Gangster Era
Presenter(s): Kaity Harms
Advisor: Dr. Michael Hofstetter, History
Abstract:

Poster Session C – Ag Business, Mathematics & Psychology

64
Title: Agricultural Development in Zimbabwe
Presenter(s): Kayla Stenzel & Hailey Becker
Advisor: Dr. Sang Jung, Agribusiness Mgmt
Abstract: Like many other developing countries in the world, Zimbabwe has been faced with certain issues that have affected its agricultural sector. Lack of technology and major natural resources has failed to improve both the quantity and quality of arable land within the country. One of Zimbabwe's most significant concerns deals with frequent devastating droughts and poor irrigation and water-conserving systems, which can ultimately result in a loss of crop yields. This leads to some of the country's biggest hardships such as, hunger, malnutrition, premature death, and loss of livestock. Zimbabwe's government struggles to maintain employment for its citizens, causing people to depend sometimes solely on agriculture. Without more focus on agricultural improvements, expensive imports are becoming more necessary, harming the economic structure of the country. An improved agricultural system would benefit Zimbabwe's standard of living and help the country to secure a promising future in agriculture.

65
Title: Developing Agriculture in Niger
Presenter(s): Andy Olson
Advisor: Dr. Sang Jung, Agribusiness Mgmt
Abstract: Niger is an African providence with 80 percent of its total 1,270,000 square kilometers in

the Sahara Desert that is constantly spreading, moving farmers out of their homes. This problem affects the 15.5 million people that live mostly in rural farming communities that need help to continue living off the land. This project was dedicated to the research of new technologies, planting techniques, and preservation of the environment for generations to come. One of the solutions to this issue is using the river the country is named after to provide water for irrigation on the desert soil. The cost will be significant but the results would be life changing. Cost and issues were still under investigation during the submission of the abstract.

66
Title: Agriculture of Benin, Africa
Presenter(s): Meagan Williams & Angela Rush
Advisor: Dr. Sang Jung, Agribusiness Mgmt
Abstract: The Republic of Benin is a low income country within the Sub-Saharan region of Africa. They are a country which is having difficulty producing enough food to eat, sell in markets, and to export for income. Agriculture is the main source of income and work within low income countries. Most of the population lives on subsistence farming for their livelihood. Benin's government has strict policies aimed at price stability, which is at the mercy of weather conditions when it comes to inflation. Although, their exports do not compare to their partners, they are trying hard to change their agricultural practices to help secure a more sustainable future. Benin is also receiving extreme investment support for infrastructures, agricultural development and service sectors. With the continuing investments, governmental programs and help with technology, Benin has a strong chance of overcoming poverty and low income issues.

67
Title: Setting Insurance Companies Policies Prices
Presenter(s): Rachel Groff
Advisor: Dr. Carl Olimb, Mathematics
Abstract: Insurance companies compute life insurance from a number of factors, such as gender, age, and tobacco use. However, a large part of the equation is based on a mortality table, which looks at the likelihood someone will die at a certain age. With this, a present value formula is used to find the net single premium proceeded by a present value formula to find the annuity payment. Based on the mortality rate, a female is less likely to die than a male, and a non-smoker is less likely to die than a smoker, the older someone is also implies the more likely they are to die. We show this directly correlates with the price of that person's life insurance policy.

68
Title: Tiling Spaces
Presenter(s): MayVang Thao
Advisor: Dr. Carl Olimb, Mathematics
Abstract: Tessellations of the plane are often periodic. That is, you can translate to a point that looks exactly like the original. However, there exists tessellations that are aperiodic. Formally, given a tessellation t, there does not exists any 2 dimensional vector v, such that t + v = t. Proving a tessellation is periodic or aperiodic is not trivial. We investigate different methods, including an implementation of the Perron-Frobenius Theorem.

69
Title: Who ranks at the top? Using ranking algorithms to rank NFL teams
Presenter(s): Jordan Bakken
Advisor: Dr. Carl Olimb, Mathematics
Abstract: In the research, I have found three different ranking algorithms to rank and compare all 32 NFL teams. Then also compare this to the Super Bowls won and the playoff appearances to see which NFL team ranks at the top in the past five years. This research will look at the win/loss record from each team related to all the other teams and also the score differential between the two teams to come of with the ranks produced using a matrix for the different algorithms. Each method has its positives and negatives but together they will produce which team is number one.

70
Title: Making Math More "Common", Minnesota State Standards Better Than Common Core?
Presenter(s): Julie Thaemert
Advisor: Dr. Carl Olimb, Mathematics
Abstract: Currently, common core has been adopted in 43 states, Minnesota not being one. Though Minnesota has adopted common core for reading, they have not yet made the conversion for math. With the review of the math standards just around the corner, individuals are beginning to voice their opinion on the topic; should Minnesota keep their current standards, which some say to be much higher than the common core standards, or make the switch to common core, so there is consistency across state lines and more opportunities for higher student learning. After surveying numerous parents, teachers, principals, and professors, it is clear that some things may not be what they seem.

71
Title: Subtraction: Traditional vs Common Core
Presenter(s): Lizzy Bruder
Advisor: Dr. Carl Olimb, Mathematics
Abstract: The most contentious topic in U.S. education is the lack of a system of consistent standards for student achievement. For most states, the fix has been the Common Core. We plan to compare benchmarks, namely subtraction algorithms, of the Common Core with previous standards. Then survey students to decide which method is more beneficial to a student's future learning.

72
Title: The Golden Ratio and Fibonacci Sequence
Presenter(s): Dyreen Nyagesuka
Advisor: Dr. Carl Olimb, Mathematics
Abstract: The poster will give a detailed description of Golden Ratio and Fibonacci Sequence and their relationship to one another. With the various operations performed, we see various patterns beginning to emerge. These numbers appear throughout nature in the forms and designs of many plants and animals and also in art and architecture.

73
Title: Predicting Climate Change Through a Mathematical Analysis of Glacial Cycles
Presenter(s): Jessica Hulzebos
Advisor: Dr. Carl Olimb, Mathematics
Abstract: An examination of climate data over the past 3 million years reveals a pattern of glacial and interglacial periods. Past research has made it evident that these periodic glacial cycles are strongly affected by Earth's orbital parameters: obliquity, eccentricity, and precession. The notion that CO_2 also affects climate has been around for over 100 years, yet its effect on glacial cycles remains vague. I will compare several different models that incorporate CO_2 as a cycle forcing mechanism in an attempt to conclude that CO_2 is a significant factor in glacial cycles and the Earth's climate overall.

74
Title: Quaternions and its Applications for Society: Rotation Sequences Used For Un-manned Weather Satellites
Presenter(s): Jeffrey Thompson
Advisor: Dr. Carl Olimb, Mathematics
Abstract: Quaternions give an abstract means of representing rotation. Its unique properties and algebra, appears to give a quaternion rotation operator. The quaternion rotation operator competes with the conventional matrix rotation operator in a variety of rotation sequences. The rotation sequences can be used to direct satellites under complex rotational guidelines. In certain analytical procedures it is found that the quaternion can offer fundamental computational, operational and or implementation and data handling advantages over the conventional rotation matrix.

75
Title: When Do We Learn Best: The Timing of Math is Affecting Student Learning
Presenter(s): Jordan Geraets
Advisor: Dr. Carl Olimb, Mathematics
Abstract: Schools have been focused on a standard-based curriculum and assessing student's knowledge by state-mandated standardized tests rather than focusing on how students learn best. Mathematics is one area that has been affected by these tests but what schools do not realize, is that students may not learn best at the time that they have class. A common assumption is that most subjects need to be taught in the morning because that is when students pay more attention and comprehend more content. The purpose of this study is to examine if the time of day influences student learning and accuracy on mathematical content. This study uses a variety of methods to collect data on high school students' ability in mathematics and uses a questionnaire to determine when students think they concentrate best during the day. The results of this study show the effects of time-of-day instruction on student performance in mathematics.

76
Title: Memory for Organized and Unorganized Words for those with Expertise and No Expertise
Presenter(s): Kayla Larson, Shelby Julian, April Schulte & Nicole Rasmussen
Advisor: Dr. Scott Peterson, Psychology
Abstract: The general topic area of our experiment is whether individuals can remember more words when they are presented in an organized manner, making it easier to chunk the items together rather than being placed randomly in a list. Previous research has shown that an organized list resulted in better recall. Our experiment will involve going into two psychology and two chemistry classrooms and showing students a list of terms, half related to psychology and the other half related to chemistry, that they will later have to recall. We predict psychology and chemistry students will better recall terms related to their majors when they are placed in

an organized list with cue words versus unorganized and without cue words.

77
Title: Developing a Personality
Presenter(s): Charles Martinson
Advisor: Dr. Scott Peterson, Psychology
Abstract: **WITHDRAWN**

78
Title: Congruent words vs. non-congruent words: How far does the Stroop effect go?
Presenter(s): Dan Francis, Jr., Kimberly Schumacher, Matthew Carlson & Bailey Andersen
Advisor: Dr. Scott Peterson, Psychology
Abstract: The Stroop task is widely used in psychology to test an individual's selective attention and processing ability. The Stroop effect is observed when an individual is presented with a colored word (red, blue, or green) and asked to report the color of the word. Reaction time in reporting the color of the word is faster when the word and ink match than when non-congruent. This is due to the brain being faster at automatic processes, such as reading, and being slower at controlled processes, such as reporting the color. In our experiment, we attempt to replicate the original Stroop effect and also determine whether there is a Stroop phenomenon with words that are associated with colors (ocean, sky). In both parts of the experiment congruent and non-congruent words were used. Data were analyzed using SPSS to determine if there is a Stroop effect. Further results are discussed on the poster.

79
Title: Gender Differences in the Development of Depression
Presenter(s): Brian Redemske
Advisor: Dr. Scott Peterson, Psychology
Abstract: Major Depressive Disorder is a mental disability affecting many people throughout the world, primarily females. It's been proven that at least twice as many females live with depression as males for a variety of different reasons. This gender gap in the development of depression is created during the adolescence years of each generation. The gender gap is created by both genetics and the environment the people are in. This research examines some of the many reasons for why females develop depression more easily, as well as explains the differences in people of all ages and how/why they develop the mental disorder. The information presented here comes from a variety of sources examining depression and the gender gap.

80
Title: Effects of Homosexual Parenting on Children
Presenter(s): Honor-Ra Hanson & Monique Beaulieu
Advisor: Dr. Scott Peterson, Psychology
Abstract: In the past decade, same-sex marriage has become more common, with the increased support of marriage equality. Because of this, the amount of children being raised by homosexual parents has increased as well. Children in this study include those who have been adopted and those conceived from either parent. But how does homosexual parenting affect the children that these couples have? Research was conducted in order to prove whether or not children raised by same-sex parents are significantly affected during development. We concluded these children are not negatively influenced by their parents' sexual orientation, supporting our hypothesis.

81
Title: The Effect of Picture and Word Context On Recognition Of Component Parts
Presenter(s): Kaltuma Osman & Spencer Thomas
Advisor: Dr. Scott Peterson, Psychology
Abstract: This study is designed to investigate whether concepts are learned quickly by viewing pictures or in written forms. We hypothesize that concepts that are learned by visualization are more easily and frequently recalled that those that are learned by viewing in written word form, we also hypothesize that the picture test would hold a significantly higher number of correct responses over the word test. Our participants will consist of 20 undergraduate SMSU students. The participants will view the exact words and pictures on PowerPoint slides. The slides on PowerPoint will include 25 words and 25 pictures, subjects are asked to respond as quickly and as accurately as possible. The words and images will appear on the screen for half of a second it disappears and the next set will be shown.

82
Title: Comparing visual and auditory memory in college students with different learning styles
Presenter(s): Brittany Lade, Greta Jeska, Mark Jankowski & Rachel Trueblood
Advisor: Dr. Scott Peterson, Psychology
Abstract: Individuals learn in different ways. The two basic types would be learning through visual aids and text (visual learners), or learning through

audio or spoken language (audio learners). Sixty students from SMSU were recruited to participate in an experiment in which they were presented random words on the computer in a visual format, audio format, or a format that included both a visual and audio representation. It is predicted that the students will remember more of the words when the condition is congruent with their learning style. In addition, we predict that the test group that receives both the audio and visual format will perform the best because that test group will be able to utilize two memory stores instead of just one.

83
Title: Benefits of Tutoring
Presenter(s): Carly Salfer & Seth Lewis
Advisor: Dr. Scott Peterson, Psychology
Abstract: Do you know the benefits of tutoring? Did you know that tutoring does not just benefit the tutee, but also the tutor? This paper examines the effects of tutoring and the most effective methods of tutoring. Through means of experiments and researching scholarly articles, we found that tutoring increases cognitive strategies, increases social and management skills, and leads to a greater number of students to graduate. Students who participate in tutoring show a significant decrease in stress and anxiety, and a significant increase in overall enjoyment of the college experience.

Abstracts

Original Art Works – Art Program

1
Title: Jessica Bruss Senior Art Exhibition, Art Studio
Presenter: Jessica Bruss
Advisor: Robert Dorlac, Art Program
Abstract: I am Jessica Bruss, and I am a studio artist. In this show, I have been experimenting with new mediums by combining painting and sculpture to create something a little more unique. I have done research on artists throughout the centuries and by combining those art styles with contemporary modern forms of tattoo art I have discovered my own style. My primary subjects derive from personal and family experiences and also contain animals and their skeletal structures.

2
Title: Josephine Jobgen Senior Art Exhibition, Art Studio
Presenter: Josephine Jobgen
Advisor: Robert Dorlac, Art Program
Abstract: My paintings are a combination of inspiration from human emotion, reference research, and life experiences. The content of my paintings are original ideas that I've fabricated after experiencing a lot of different emotions. From heart break to jealousy to feelings of absolute happiness, my work is a depiction of everything I've experienced in life. A lot of the research I do is photography research so I can see the way emotion is shown in the human body. I try to use a realistic style when painting because I want my works to look lifelike and expressive. I want the emotion being portrayed to be clear. I work with acrylic paint and I like to blend using water and thin layers of paint. I also use color to convey certain emotions.

3
Title: Sia Lor Senior Art Exhibition, Art Studio
Presenter: Sia Lor
Advisor: Robert Dorlac, Art Program
Abstract: My works of art are all based on an experimental process and journey. I work with repeated shapes, play with colors and use collaging elements to create visual forms. I want the audience to have their own interpretation and view of my work.

4
Title: Traci Otten Senior Art Exhibition, Graphic Design
Presenter: Traci Otten
Advisor: Alma Hale, Art Program
Abstract: Oxford Dictionary defines art as the expression or application of human creative skill and imagination (1). By this description literature, dance, and graphic design are all included in art. At the beginning of my designing career I saw my designs as expressions and creative skill, however, I did not perceive myself as an artist. I realized my skill may not be to draw or to paint, but my art is expressed through design. My approach to designing is unique compared to other designers. I usually begin by collecting content. After I have the content, I move into my initial sketches on the computer. I aim for my final designs to be professional, eye-catching, informative, innovative, and aligned with my client's needs and desires. I keep the future audience in mind as I go through my creative process of making art through designing.

5
Title: Jayme Wiertzema Senior Art Exhibition, Art Studio
Presenter: Jayme Wiertzema
Advisor: Robert Dorlac, Art Program
Abstract: My paintings are a product of life experiences, creativity and research. The content of my paintings comes from life experiences. I paint people, places and things that are familiar to me. I use my creativity to emphasize textures and colors as elements of art in my paintings. These elements allow me to interpret subjects in different ways. My research base is ongoing. I am currently basing my style and paintings on my studies of the Impressionistic art movement. Artists that I have specifically studied are Van Gogh and Monet. I am inspired by these artists' Impressionist styles and use of broken color in their paintings.

6
Title: Em Woodrow Senior Art Exhibition, Graphic Design
Presenter: Emily Woodrow
Advisor: Alma Hale, Art Program
Abstract: Em Woodrow is a driven graphic artist who works in many different areas of art and design. Her work spreads from graphic and web design, to scenic design and painting. Each new face she wears when working with different designing venues brings fresh, dynamic work that influences and inspires each other new design and piece of work. Inspired by theatre and nature, her work brings a

painter's approach to graphic design; creating more organic and fluid work rather than logical and geometric designs. Here we see the fruit of her life experiences, inspirations, and influences in her portfolio and brand. Enjoy.

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