Celebration of Student Research, Creative Works and Academic Service Learning

Presentations: April 16, 2009 in the LRC from 9:00 a.m. until 4:00 p.m.

Sponsored by the Office of Academic Affairs and the College of Graduate Studies

Northern Michigan University

An EO Institution
The 14th Annual Celebration of Student Research, Creative Works & Academic Service Learning

Northern Michigan University

April 16, 2009, marks the fourteenth annual symposium of student presentations entitled “Celebration of Student Research, Creative Works & Academic Service Learning.” The celebration is from 9:00 a.m. to 4:00 p.m. with oral presentations and poster presentations in the lower level of the LRC, rooms 109 and 111-I. This event provides our students an excellent opportunity to gain experience in presenting their own work and will highlight, for the entire university community, the student/faculty mentoring of which we are so proud. Both undergraduate and graduate students have been invited to present the results of their independent scholarly and creative work.

This celebration is sponsored by the Office of Academic Affairs and the College of Graduate Studies.

2009 Northern Michigan University TLC Student Awards

These awards recognize the innovative use of laptop computers in the academic environment by students

Technological Sophistication

Michael S. Beckett: School of Art & Design

Other Innovative Uses

Monica Zavala: Department of English

Learning Improvement

Anthony LaMalfa, Edward Donatell, Trisha Pepin, Emily Engelhardt: Group Project, School of Education
LRC 109

9:00 **Opening Comments and Awards:** Dr. Cynthia Prosen, Dr. Susan Koch, and President Les Wong

9:30 **Michael Beckett:** TLC-Portfolio Building. Department of Art & Design, Faculty Advisor: Professor Stephan Larson

9:45 **Bill Banks, Chris Ranta, Glenda Ross, Dennis Sabo:** Hospitality Management Facility Refrigeration Energy Audit, Class Project. Technology & Occupational Sciences, Undergraduates, Faculty Advisor: Dr. Nick Griewahn

10:00 **Amy J. Molenaar:** A Comparison of Conditioning Levels Between Off-Season and Competition Season for Division II Women’s Volleyball. Department of Health, Physical Education, & Recreation, Graduate, Faculty Advisor: Dr. Randall Jensen

10:15 **Nicole Weber, Ashley Bollwahn & Kady Adams:** Memory Enhancement Educational Intervention at Local Senior Centers: An Overview. Department of Health, Physical Education, & Recreation, Undergraduates, Faculty Advisors: Dr. Patti Hogan & Dr. Mary Jane Tremethick

10:30 **Students EC 425 Class (group 1):** YouTube: Capturing International Economics in Action across the Upper Peninsula of Michigan. Department of Economics, Undergraduates, Faculty Advisor: Dr. Tawni Ferrarini

10:45 **Brad Schoenrock, Eric Schaff, & Levi Kanger:** Gamma Ray Spectroscopy Analysis of Sediment and Soil Samples in Marquette County, Michigan for Pb-214, Cs-137, and Bi-214. Undergraduates, Department of Physics, Faculty Advisor: Dr. William Tireman,

11:00 **Courtney Whitfield:** Adult ADHD/ADD (attention deficit/hyperactivity disorder). Undergraduate, Department of Economics

11:15 **Kady Adams:** The Role of Exercise in the Management of Arthritis. Department of Health, Physical Education & Recreation, Undergraduate, Faculty Advisor: Dr. Mary Jane Tremethick

11:30 **Sarah K. Leissring:** Reliability of Forces during Variations of Plyometric Exercises. Department of Health, Physical Education & Recreation, Undergraduate, Faculty Advisor: Dr. Randall Jensen

11:45 **Stephen McClain & David Lachepelle:** Practical Theatrical Design. Communication & Performance Studies Department, Undergraduates, Faculty Advisor: Dr. Victor Holliday
12:00 Rachel Pomeroy: Teaching for Learning, Impact and Insight by ED 231. School of Education, Undergraduate, Faculty Advisor: Dr. Judith Puncochar

12:15 Kirstin Meyer: Aesthetics of Visual Art and Music, 17th-20th Centuries. Department of Modern Languages & Literatures, Undergraduate, Faculty Advisor: Dr. Nell Kupper

12:30 Samantha Laggerman & Sarah Harriger: A Thematic Analysis of Nursing Students’ Experiences. Nursing Department, Undergraduates, Faculty Advisor: Dr. Mary Ellen Powers

12:45 Steven Puroll: A Comparison of Computer-Based and Paper-Based Measures of Mental Rotation. Undergraduate, Department of Psychology, Faculty Advisors: Dr. Sheila Burns & Dr. Charles Leith

1:00 Leanne J. Pylkas and Kady Adams: Increasing Awareness of Healthy Nutrition-Related Weight Management Techniques in College Students through Social Marketing. Department of Health, Physical Education & Recreation, Undergraduates, Faculty Advisor: Dr. Patti Hogan

1:15 Sara Osborn & Danyelle Hedin: Increasing Fundamental Motor Skills in Pre-Kindergarten and Kindergarten Children through Physical Education. Department of Health Physical Education and Recreation, Undergraduates, Faculty Advisor: Dr. Patricia Hogan

1:30 Kirstin Meyer: Freshwater Crabs of Madagascar. Department of Biology, Undergraduate, Faculty Advisor: Dr. Neil Cumberlidge

1:45 Elizabeth Holly: Neurtensin Drugs for the Treatment of Memory Impairment. Department of Psychology, Undergraduate, Faculty Advisor: Dr. Adam Prus

2:00 Katherine Stelmaszek, Keith Voorheis, & Jason Morgan: Election Issues Reported for Public Television by Members of the Politics and the Press Course. Undergraduates, Faculty Advisors: Dr. Charles Ganzert and Dr. Steven Nelson

2:15 Casey Thayer: Margins: Liminality and the Poetry of Place. Department of English, Graduate, Faculty Advisor: Dr. Austin Hummell

2:30 Cassie Burke & Lorne Washburn: Program and Evaluation Planning: Osteoporosis Awareness. Department of Health, Physical Education & Recreation, Undergraduates, Faculty Advisor: Dr. Patricia Hogan

2:45 Lindsay Backes and Jayme Murray: Inter-professional Collaboration Using Problem Based Learning for Health Professionals: An Analysis. Health, Physical Education, & Recreation, Undergraduates, Faculty Advisor: Dr. Patricia Hogan
3:00  **Marie Formolo:** One World Many Drums Many Voices: a performance event on the global issue of AIDS-related stigma using dance, song, drums and visuals, directed by Maria Formolo, Graduate Student, with the modern dance class, global communication students, NMU dance club and members of local drum groups. Communication & Performance Studies Department, Faculty Advisor: Dr. Louise Bourgault

**LRC 111-I**

9:30  **Hannah Granlund:** Documenting the Growth of Online Classes and Programs at Northern Michigan University. School of Education, Undergraduate, Faculty Advisor: Dr. Judith Puncochar

9:45  **Callie Youngman:** A New Way of Living and Gathering: the Hiawatha Traditional Music Festival: A History. Departments of History, Political Science and Modern Languages and School of Education, Undergraduate, Faculty Advisor: Dr. Gabe Logan

10:00  **Kathryn Polus:** Structuring Controversy in an Online Format: Who has it tougher females or males? School of Education, Undergraduate, Faculty Advisor: Dr. Judith Puncochar

10:15  **Alison Spaude:** Irish Food and Culture. Department of English, Graduate, Faculty Advisor: Dr. Paul Lehmberg

10:30  **Bill Severud:** Effects of Predator Scent on Use of Foraging Trails by Beavers. Department of Biology, Graduate, Faculty Advisor: Dr. John Bruggink

10:45  **Duduzile P. Mashinini:** Sexual Attitudes and Perceptions of Gendered Sexual Roles from the Perspective of Urban South African Women. Department of Psychology, Graduate, Faculty Advisor: Dr. Mary Pelton-Cooper

11:00  **Ivy M. Vachon:** Ultraviolet-Visible and Fluorescent Characterization of Para-Substituted Phenylacetylenes and Novel Highly Polarized Molecules Utilizing a Propellane-Derived Linker Unit. Department of Chemistry, Undergraduate, Faculty Advisor: Dr. Frankie McCormick

11:15  **Teasha Flury and Kittrick Krueger:** One Night at the Call Center. Communication and Performance Studies Department, Undergraduates, Faculty Advisor: Dr. Louise Bourgault

11:30  **Elizabeth Crachiolo:** “Eye-Hopes Deceitful Prove”: The Spectacle of the Female Body in Sir Philip Sidney’s “The Old Arcadia”. Department of English, Graduate, Faculty Advisor: Dr. David Wood

11:45  **Eric Schaff and Levi Ekanger:** Analysis of Isotope Levels in Sediment Samples using a Sodium Iodide Scintillator. Department of Physics, Undergraduates, Faculty Advisor: Dr. William Tireman
12:00  **Jen VanDragt**: Rail Capacity of Marquette County. Department of Geography, Undergraduate, Faculty Advisor: Dr. Steve DeGoosh

12:15  **Jodi Lynn Tervo**: Peak Velocity of Nordic Ski Double Pole Technique: Stand-up Skiing vs. Adaptive Sit-skiing. Graduate Independent Research, Health Physical Education and Recreation Department, Faculty Advisor: Dr. Randall Jensen

12:30  **Claire Smith**: Exploration of Health Journalism through a Problem Based Learning for Health Professionals Class. Department of Health Physical Education & Recreation, Undergraduate, Faculty Advisor: Dr. Patricia Hogan

12:45  **Lisa Geoffrion**: Conduct Disorder and Implications of Current Genetic Causality. Psychology Department, Undergraduate, Faculty Advisor: Dr. Harry Whitaker

1:00  **Anthony LaMalfa, Edward Donatell, Trisha Pepin, & Emily Engelhardt**: TLC-Learning Disabilities Debunked, Learning Improvement. School of Education, Faculty Advisor: Dr. Laura Reissner

1:15  **Lindsay Backes and Jayme Murray**: Inter-professional Collaboration Using Problem Based Learning for Health Professionals: An Analysis. Health Physical Education, & Recreation, Undergraduates, Faculty Advisor: Dr. Patricia Hogan

1:30  **Justine Pinskey**: The Role of Aldehyde Dehydrogenase in Brain Tumor Stem Cell Proliferation. Department of Biology, Undergraduate, Faculty Advisor: Dr. Robert Winn

1:45  **Danielle St. Onge and Jessica Trotochaud**: Increasing Fitness in Youth through Education and Training. Department of Health Physical Education & Recreation, Undergraduates, Faculty Advisor: Dr. Patti Hogan

2:00  **Kimberly Lamb, Rob Manty, Levi Tadgers, Tracy Micheau, and JD Lyons**: Teaching Anishinaabe Language to Marquette Public School Children, NAS 488: Native American Service Learning Project. Native American Studies, Undergraduates, Faculty Advisor: Dr. Adriana Greci Green

2:15  **Daniel Digneit**: Standing O, Undergraduate Academic Service Learning. Department of Media Productions, Undergraduate, Faculty Advisor: Dr. Louise Bourgault

2:30  **Katherine Massie & Olivia Sliwa**: To Decrease Depression Symptoms in Depressed College Students through Physical Activity. Department of Health, Physical Education, and Recreation Department, Undergraduate Students, Faculty Advisor: Dr. Patricia Hogan

2:45  **Amy Hickey**: Homosexuality and the Holocaust: A Review of Masculinity, Sexuality, and Murder. Department of Modern Languages and Literatures. Undergraduate, Faculty Advisor: Dr. Bill Mihalopoulos
3:00 **Michael Head & Brian Roach:** International IT Seminar: A Reflection. Undergraduates, College of Business, Faculty Advisor: Professor Sandra Poindexter

3:15 **Students EC 425 Class (group 2):** YouTube: Capturing International Economics in Action across the Upper Peninsula of Michigan. Department of Economics, Undergraduates, Faculty Advisor: Dr. Tawni Ferrarini

3:30 **Students EC 425 Class (group 3):** YouTube: Capturing International Economics in Action across the Upper Peninsula of Michigan. Department of Economics, Undergraduates, Faculty Advisor: Dr. Tawni Ferrarini

3:45 **Students EC 425 Class (group 4):** YouTube: Capturing International Economics in Action across the Upper Peninsula of Michigan. Department of Economics, Undergraduates, Faculty Advisor: Dr. Tawni Ferrarini

4:00 **Shinya Abe:** Effect of Ski Boot’s Tightness on Shock Attenuation Time and Minimum Knee and Ankle Joint Angles with Anterior-Posterior Foot Positioning in Sledge-Machine Drop Landing. Department of Health, Physical Education and Recreation, Undergraduate, Faculty Advisor: Dr. Randall L. Jensen

**ORAL PRESENTATIONS**

**YouTube: Capturing International Economics in Action across the Upper Peninsula of Michigan**
Students EC 425 Class, Undergraduates, Department of Economics, Faculty Advisor: Dr. Tawni Ferrarini

Fifteen students enrolled in International Economics (EC425) and divided into five groups are going to feature in YouTube clips how international economic forces are alive and well in the Upper Peninsula of Michigan. These clips will highlight how international trade and finance contribute to the accumulation of wealth and fuel prosperity.

**Effect of Ski Boot’s Tightness on Shock Attenuation Time and Minimum Knee and Ankle Joint Angles with Anterior-Posterior Foot Positioning in Sledge-Machine Drop Landing**
Shinya Abe, Undergraduate Student, Department of Health Physical Education & Recreation, Faculty Advisor: Dr. Randall L. Jensen

It is well known that the ACL injury is one of the major injuries in alpine skiing, and strength of some muscles, for example hamstrings, are important to prevent the ACL injury. However, no studies have examined how tightness of ski boots and different landing positions affect shock attenuation time and knee and ankle joint angles. Studying these aspects of the landing may help reveal the mechanism of the injury. Furthermore, results may even be helpful to design future ski boots. In this study, subjects performed a criterion called “Sledge Drop Landing”. Subjects performed a down phase of a single squat using a machine called “Sledge”. This criterion, “Sledge Drop Landing” mimics the landing phase of skiing. Shock attenuation time, and kinematic data such as joint angles while drop landing were measured. The major part of this study was examining if there are any changes in shock attenuation time at different landing positions with different ski boot’s condition (loose, middle tight, very tight, and barefoot conditions).
The Role of Exercise in the Management of Arthritis
Kady E. Adams, Undergraduate Student, Department of Health Physical Education & Recreation,
Faculty Advisor: Dr. Mary Jane Tremethick

One in five adults in the United States has been diagnosed with some form of arthritis. Children may also be diagnosed. Arthritis negatively affects the daily lives of nearly everyone afflicted, often causing pain and stiffness that limits activities of daily living and prevents full productivity. There are several traditional treatments for arthritis, but physical activity is not always prescribed or well promoted. The most common forms of arthritis will be presented, along with the effectiveness of exercise as a treatment, the benefits and risks involved, and exercise programming considerations. Health promotion recommendations and available free resources will also be discussed.

Inter-professional Collaboration using Problem Based Learning for Health Professionals: An Analysis
Lindsay Backes and Jayme Murray, Undergraduate Students, Health, Physical Education, & Recreation,
Faculty Advisor: Dr. Patricia Hogan

As part of an experimental course in Problem Based Learning (PBL) for health professionals we were given health problem scenarios and then asked to address issues in these scenarios from different health profession perspectives. One PBL scenario involved a MRSA situation; we will present the scenario, and then present the research we identified concerning how different health professionals (in our case, school social worker and school superintendent – former health education teacher) would address the scenario.

Hospitality Management Facility Refrigeration Energy Audit
Bill Banks, Chris Ranta, Glenda Ross & Dennis Sabo, Undergraduate Students, Technology & Occupational Studies Department,
Faculty Advisor: Dr. Nick Griewahn

This project is an effort by students of the climate control technology program to bring the University and the hospitality management (HM) facilities into line with industry efficiency standards and the sustainability initiatives of the Roadmap to 2015. An audit was performed on the 4 existing walk-in coolers and freezers and the energy usage data was compared to state of the art equipment to determine the length of payback and the immediate savings that would be realized by the University if the equipment was upgraded. The costs that were considered include water use, electrical power consumption, initial new equipment costs and maintenance costs. It was discovered that an updated system incorporating the newer energy efficient technologies available would pay for itself in a few years time.

Program and Evaluation Planning: Osteoporosis Awareness
Cassie Burke & Lorne Washburn, Undergraduate Students, Department of Health, Physical Education & Recreation,
Faculty Advisor: Dr. Patricia Hogan

The idea of this class project is to become familiar with and then master the concept of Program Planning and Evaluation. The projects are a culmination of the many steps taken in order to implement an effective program to change a habit or behavior of a chosen priority population. In our project, in particular, we focus on the awareness of osteoporosis risk factors in our priority population, which we chose to be the patients of Orthopedic Associates in Marquette. The projects can take on any focus and priority population but still follow the same general Program Planning and Evaluation Model in formulating the mission, goals, objectives, and program.
We use the Program Planning and Evaluation model in a creative way in order to invoke the attention of our targeted population. Not only is the Program Planning and Evaluation Model used, but we also focus on a particular Behavior Change Model, Health Literacy, and appropriate competencies (CHES, NSCA, MI Health Education Teacher Standards, ACSM, etc.). Using our knowledge and understanding of these models and competencies we set out to develop a quality (safe, relevant and effective) program for health education and then a plan to implement and evaluate these programs.

“Eye-Hopes Deceitful Prove”: The Spectacle of the Female Body in Sir Philip Sidney’s “The Old Arcadia”

Elizabeth Crachiolo, Graduate Student, Department of English, Faculty Advisor: Dr. David Wood

In his Renaissance-era proto-novel “The Old Arcadia,” Sir Philip Sidney tells the story of two princes who disguise themselves in order to seduce two princesses who have been kept in seclusion by their father. Images of beauty, particularly in terms of female bodies, permeate the text and are linked with notions of virtue and morality. In my paper, I use the feminist theory of “the gaze” (both the male gaze and the female gaze) in order to demonstrate the ways in which Sidney problematizes this link between beauty and virtue and complicates notions of morality as a whole.

Standing O

Daniel Digneit, Undergraduate Student, Academic Service Learning, Department of Media Productions, Faculty Advisor: Dr. Louise Bourgault

Standing O is a student run, live music performance show. We had the pleasure of filming a few African musicians who visited NMU in Mid-March. Heading the performance was a man named Bernard Woma. Bernard plays and instrument called the gyll. We recorded several songs from the musicians and also conducted an interview.

One Night at the Call Center

Teasha Flury, and Kittrick Krueger, Undergraduate Students, Communication and Performance Studies Department, Faculty Advisor: Dr. Louise Bourgault

This presentation is on a book called One Night at the Call Center by Chetan Bhagat. The presentation includes a PowerPoint discussing a review of the book and its plot, as well as how the book can be related to globalization in today’s world.

Conduct Disorder and Implications of Current Genetic Causality

Lisa Geoffrion, Undergraduate Student, Department of Psychology, Faculty Advisor: Dr. Harry Whitaker

Conduct Disorder is diagnosed in children with an ongoing and severe pattern of uncooperative, violent, and hostile behavior toward authority figures that seriously interferes with the child’s day to day functioning. These children often end up as clients of the juvenile court system, and several studies have shown that up to 65% of children in the juvenile court system have been diagnosed with some form of conduct disorder. Are these children the victims of poverty, low expectations and poor parenting? Maybe not. Current genetic studies have shown that conduct disorder is highly heritable, and several gene markers have been linked to conduct disorder. What are the societal implications of this new information?
Documenting the Growth of Online Classes and Programs at Northern Michigan University
Hannah Granlund, Undergraduate Student, School of Education

Tracking growth in online classes and programs enables researchers to identify academic areas of future growth in online learning. A team of researchers improved a time-intensive method for documenting growth of online courses and programs. Their research resulted in an extension of a baseline of online courses and programs during the 2007-2008 and 2008-2009 academic terms at Northern Michigan University. Rapid growth for online learning was apparent. The percentage of required courses offered online by program area increased 28% between 2007-2008 and 2008-2009. Documentation of elective courses added a new category to the baseline. A comparison of the number of required courses online with elective courses online identifies areas of rapid growth and new opportunities for online learning.

International IT Seminar: A Reflection
Michael Head and Brian Roach, Undergraduate Students, College of Business, Faculty Advisor: Professor Sandra Poindexter

In February 2009, the NMU College of Business hosted the 4th Annual NMU International IT Student Seminar to bring together students from Finland, Spain, Denmark and the United States. The purpose of the seminar was to share knowledge about current topics in the information technology industry. After the event, students were assigned to write a reflection of the event using a method of their choosing; ours was the design and implementation of a website (http://cob.nmu.edu/itseminar/ITseminar2009.htm). In the development of the website, we used information learned from presentations during the seminar as well as our prior knowledge. The website was made accessible according to W3C standards and was made with several open source software solutions. Overall, participating students learned a lot about other cultures and current IT trends on an international business level. The website allowed us to document and reflect upon the event, and share it with other participants, and create a place to recruit students for the 5th annual event.

Homosexuality and the Holocaust: A Review of Masculinity, Sexuality, and Murder
Amy Hickey, Undergraduate Student, Department of Modern Languages and Literatures, Faculty Advisor: Dr. Bill Mihalopoulos

In the first half of the twentieth century, Central Europe was home to one of the most devastating genocides in modern history. Under the direction of Adolf Hitler, over six million individuals perished in the attempt by the National Socialist party of Germany to create an ideal Aryan homeland. While European Jews were murdered in the largest numbers, hundreds of thousands of other victims also lost their lives. This presentation will focus on gay and lesbian women who suffered under Nazi rule and were murdered in concentration camps. While Berlin boasted a vibrant gay community prior to 1933, the conservatism ushered in by Nazi Germany continued for nearly thirty years after the war, leading to the re-arrests of homosexual concentration camp survivors under the same law which the Nazis used to initially imprison them. This presentation will discuss the evolution of homophobia and gay persecution in Germany, how the Nazis viewed sexuality, and how the memory of homosexual victims has evolved.
A Thematic Analysis of Nursing Students’ Experiences
Samantha Laggerman, Senior Research Fellow & Sarah Harriger, Sophomore Research Fellow, Nursing Department,
Faculty Advisor: Dr. Mary Ellen Powers

Academic Service Learning (ASL) has been accepted as a valuable academic pedagogy in a wide range of disciplines, yet is relatively new to nursing education. This educational philosophy encourages student involvement in the community by providing a needed service while at the same time instilling in students the core principles of altruism, caring and social justice. Northern Michigan University’s mission statement “challenges its students . . . to become productive citizens in the regional and global community,” and NMU’s nursing department’s mission is to “educate professional nurses who are caring, competent and qualified to practice in constantly changing environments and with diverse populations.” In accordance with the aforementioned mission statements, ASL encompasses and encourages values, such as social justice and civic duty, that are crucial to attaining a functioning global community. Since Fall 2001, qualitative data has been compiled from a senior-level nursing management course via WebCT surveys, discussions and reflective essays. Data through Fall 2008 have revealed several recurrent themes that have been analyzed and expanded. This presentation discusses these themes, thereby showcasing the benefits of an Academic Service Learning experience.

Neurotensin Drugs for the Treatment of Memory Impairment
Elizabeth Holly, Undergraduate Student, Department of Psychology,
Faculty Advisor: Dr. Adam Prus

Memory impairment is a debilitating component in an array of mental disorders, such as schizophrenia and Alzheimer’s. A certain class of drugs, known as neurotensins, has been suggested to improve memory. The present study sought to evaluate the effects of the neurotensin drug PD149163 on memory in a radial arm maze using a delayed non-match to sample task. We found that the drug does in fact decrease the number of errors made by laboratory rats after a 24 hour delay. These findings suggest that PD149163 could be used to treat the memory deficits of some psychological disorders.

Teaching Anishinaabe Language to Marquette Public School Children
Kim Lamb, Tracy Micheau, Rob Manty, Levi Tadgers, and JD Lyons, NAS 488: Native American Service Learning Project, Undergraduate Students,
Faculty Advisor: Dr. Adriana Greci Green

NAS 488: Native American Service Learning Project class partnered with the Title VII Native American Education, Marquette Public School District, to enrich the Anishinaabe education of the children in the program by teaching them some Anishinaabe language. This language, originally spoken by many of the indigenous peoples of the Great Lakes, is today counted among the endangered Native American languages. As most of the Anishinaabe people in this region do not speak it, we felt strongly that we should introduce the language to the Anishinaabe children in the school system. Our project is, thus, a small part in the language revitalization efforts that are occurring nationwide. Our method is to begin with teaching the children a core group of words, using illustrations, and then to reinforce learning through repetition, storytelling and a variety of games. We are meeting twice with four different after school tutoring sessions for grade levels K-5; in the first session we introduce the words and the second session focuses on the application and practice of the words. The students have been very engaged and have made encouraging progress; hopefully this experience will help them develop an appreciation for the language and a desire to learn more.
Reliability of Forces during Variations of Plyometric Exercises
Sarah K. Leissring, Undergraduate Student, Department of Health, Physical Education, and Recreation, Faculty Advisor: Dr. Randall Jensen

Thirteen college students performed a drop jump from height equal to their peak vertical jump (DJ), single leg jumps from the left (LLJ) and right (RLJ) legs, and a counter movement jump (CMJ). Vertical ground reaction force (GRF) obtained via an AMTI force plate and video analysis of markers placed on the hip, knee, lateral malleolus, and fifth metatarsal were used to estimate reaction forces on the knee joint (KRF) and peak GRF. One-way Repeated Measures ANOVA indicated no differences for KRF and peak GRF for any of the jumps (p > 0.05). Average measures Intraclass Correlation Coefficients ranged from $r = 0.90$ to 0.97. Results indicate that peak GRF and KRF during DJ, LLJ, RLJ, and CMJ are reliable measures.

Sexual Attitudes and Perceptions of Gendered Sexual Roles from the Perspective of Urban South African Women
Duduzile P. Mashinini, Graduate Student, Department of Psychology, Faculty Advisor: Dr. Mary Pelton-Cooper

This study explores how gender inequalities might influence HIV risk, comparing both the perceived and harbored sexual attitudes of educated professional adult females to those of female college students in South Africa. This study reveals significant differences between the two populations’ own experiences and their perceptions of male attitudes, perhaps indicating a changing South Africa, one that is evolving in a post-apartheid era, one that is adapting to the HIV/AIDS epidemic.

To Decrease Depression Symptoms in Depressed College Students through Physical Activity
Katherine Massie & Olivia Sliwa, Undergraduate Students, Department of Health, Physical Education, and Recreation Department, Faculty Advisor: Dr. Patricia Hogan

For our Program Planning & Evaluation in Health & Fitness class we did a major project applying the concepts of program planning and evaluation planning while using health literacy components like self directed learning and critical thinking. We selected “decreasing depression symptoms in depressed college students through physical activity” as our mission. This project required finding an agency that had a similar mission (we chose the Health Promotion Office at NMU) and identifying a job in that agency that would allow us to engage the mission, reviewing the literature, and understanding how the literature defined, measured, and decreased depression symptoms. Then, using the literature as a guide, we identified theoretical and operational definitions for our dependent variable, appropriate models, appropriate measurement tools, an evaluation design, and finally, we identified an evidence-based program we could model, the Stronger You Program. We also had to come up with ways to market our program, and we had to find a funding agency with a similar mission. Finally, we created and presented (to the class) a powerpoint presentation of our project.

Aesthetics of Visual Art and Music, 17th-20th Centuries
Kirstin Meyer, Undergraduate Student, Department of Modern Languages & Literatures, Faculty Advisor: Dr. Nell Kupper

Aesthetics of modern music (17th century through 20th century) are considered in relation to movements of visual art occurring simultaneously in Western European society. The principles and style characteristics of each aesthetic are discussed, along with examples of music and visual art. Instead
of dividing music into three aesthetics - Baroque, Classical, and Romantic - as is commonly taught, the presenter concludes that Rococo, Realism, and Naturalism could be considered separate and valid movements in musical history.

**Freshwater Crabs of Madagascar**
Kirstin Meyer, Undergraduate Academic Service Learning, Department of Biology, Faculty Advisor: Dr. Neil Cumberlidge

Biologists estimate the world is home to some 10 million species, but to date, only 2 million have been described and named. In this study, Foza ambohtira, a new species of freshwater crab from northern Madagascar, is described. Members of this species are distinguished from the other Foza species occurring in northern Madagascar by characters of gonopod 1, the carapace anterolateral margins and sidewalls, the anterior sternum, and the major cheliped. Hydrothelphusa goudoti is also transferred to genus Foza as F. goudoti. Comments on the rare cave crab Skelosophusa prolixa from Antsiranana Province are also included based on newly discovered material.

**Practical Theatrical Design**
Stephen McClain & David Lachepelle, Undergraduate Students, Department of Communication & Performance Studies, Faculty Advisor: Dr. Victor Holliday

This project was a scenic and lighting design on the Forrest Roberts Theatre stage for the play “The Foreigner.” Under the direction of theatre professor Paul Truckey. We designed the set and the lighting for the play.

**A Comparison of Conditioning Levels between Off-Season and Competition Season for Division II Women’s Volleyball**
Amy J. Molenaar, Graduate Student, Department of Health, Physical Education, & Recreation, Faculty Advisor: Dr. Randall Jensen

The purpose of this study was to compare conditioning levels between off-season and competition season training cycles during a women’s collegiate volleyball annual training cycle. For this study 10 Division II collegiate female volleyball players adhered to two separate 13 week periodized strength and conditioning programs. The off-season program consisted of 13 weeks starting in May and ending the beginning of August. The competition season program started the beginning of August and concluded the beginning of November. The frequency for off-season training was 4 times per week which decreased to 3 times per week during the competition season. A battery of field tests was administered to measure muscular strength and endurance, power, agility, and anaerobic capacity. The field tests utilized were the vertical jump test, 1 minute sit-up, T-Test, 300 yard shuttle run, and 1 repetition maximum back squat. Measurements were taken on three separate occasions which included baseline, pre-season, and post-season. The findings of the present study indicate that off-season strength and conditioning levels for anaerobic capacity, muscular strength and endurance can be maintained during the competition season when the frequency of training is decreased to three days per week. Therefore, athletes that wish to maintain and in some areas increase conditioning levels, may decrease the frequency to three days per week during the competition season.

KEYWORDS: Periodization, Field Tests, Athlete Profile, Resistance Training, Frequency
Increasing Fundamental Motor Skills in Pre-Kindergarten and Kindergarten Children through Physical Education
Sara Osborn and Danyelle Hedin, Undergraduate Class Project,
Faculty Advisor: Dr. Patricia Hogan

We will be presenting a PowerPoint presentation of our final in-class project for Health Program Planning and Evaluation. Our mission for our program project is to increase fundamental motor skills in pre-kindergarten and kindergarten children through physical education. If we were to put our program into action we would do so by being physical educators at an elementary school like Father Marquette Elementary. We will begin by talking about the general need for increasing fundamental motor skills in young children. We will theoretically define fundamental motor skills and its components. We will also include graphic depictions of our theoretical definition and its content areas. We will test our subjects using a motor skills test and behavior change test. We will discuss the validity and reliability of our dependent variable tests and provide measurable objectives that we wish to accomplish by the end of our program to meet the need and therefore our mission. We will talk about our evaluation design, as well as discuss the different types of validity and how they relate to our program. We will give an overview of our program and the models that it was based on. We will include some of the marketing materials we would use to promote our program and finish by discussing an organization where we could apply for funding to help us implement our program.

The Role of Aldehyde Dehydrogenase in Brain Tumor Stem Cell Proliferation
Justine Pinskey, Undergraduate Student, Department of Biology,
Faculty Advisor: Dr. Robert Winn

Glioblastoma multiforme, one of the deadliest known forms of cancer, continues to have a poor prognosis despite tremendous research efforts. Within these deadly brain tumors, a small number of cells are believed to initiate tumorigenesis and retain stem cell properties, actively perpetuating the tumors’ growth. Aldehyde dehydrogenase (ALDH) is often used as a marker for these so-called brain tumor stem cells, but its functional significance remains unclear. Initial tests using the Aldefluor Assay show that U138, LN229, and SF767 human glioma cell lines all contain cells with increased ALDH expression. The goal of this experiment is to determine if ALDH inhibition by chloramphenicol and disulfiram significantly reduces brain tumor stem cell proliferation. By inhibiting ALDH in these cell lines and observing growth patterns over time, it will be possible to assess ALDH’s role in brain tumor proliferation and its suitability as a treatment target.

Structuring Controversy in an Online Format: Who has it Tougher Females or Males?
Kathryn Polus, Undergraduate Student, School of Education,
Faculty Advisor: Dr. Judith Puncochar

This research is an extension of previous research involving a pedagogical strategy called structured controversy. The structured controversy is part of the course pedagogical curriculum and was conducted online for the first time in an online learning module. Participants were NMU students who were enrolled in ED231: Teaching and Learning in the Secondary Classroom. Participants engaged in a structured controversy on gender expectations, “Who has it tougher – females or males?” The research involved an examination of the effects on learning after engaging in perspective taking. Theoretical foundations for the research include metacognition, cooperative learning, and social influence theories. Research involves creating online materials, describing the online structured controversy process, and comparing data from the online structured controversy with previous face-to-face classroom structured controversies on the same topic. Research questions involve the level of engagement on online vs. face-to-face for promoting skills of perspective taking, constructive debate, informed decision-making, and appreciation of diverse viewpoints.
Teaching and Learning in the Secondary Classroom, a course in the Education Department, includes a field component as part of the required coursework. This field component allows pre-methods education students to work with middle schoolers in several capacities. Bothwell Middle School is host to one class meeting per week and students have the opportunity to observe and participate in classrooms. Students also engage as homework helpers at Lake Superior Village Youth and Family Center. Other sites include Nah Tah Wahsh School in the Hannahville Indian Community and Sawyer Elementary School. Presenters will use the three words Academic, Service and Learning to frame their personal experience and community impact. Two planned topics of discussion are the academic benefit of relating text and theory to real world experiences and the impact service has on the development of a personal education philosophy for pre-service teachers. Presenters will collaborate to format a 10 minute presentation which creatively uses technology to convey the thoughts and perspectives of the class.

Mental rotation has been proposed as the clearest, most prototypical example of a measurable non-verbal mental activity. The basic test of mental rotation involves mentally comparing two pictures to judge whether the two representations are the same except that one is rotated out of alignment with the other. The definitive modern example of this test is a computerized reaction-time task (Shepard & Metzler, 1971) but the most commonly used convenient measure is a multiple-choice paper and pencil task (Vandenburg & Kuse, 1977). These two tasks have been treated almost interchangeably in decades of discussion without any validation that they actually measure the same mechanism. Since sex differences in performance on the paper and pencil (convenient) task are interpreted as sex differences in mental rotation, it is of some interest to know whether the convenient and definitive tasks agree. This study investigates whether performance on a computerized reaction time task (which measures of the speed of rotation in correct judgments) correlates with a multiple choice paper and pencil task (which measures percent correct judgments). In particular we will discuss our ability to replicate an earlier finding that male performances on the two tasks are more highly correlated than are female performances.

Everyday we are reminded of how important weight is in relation to our health and well-being, but the information is not often valid or portrayed in a reliable way. It has been shown that college students are increasingly searching for diet-related information, but many turn to “fad diets” or other unhealthy weight-loss methods for the solution. This class project was designed as an authentic learning process where students follow a program planning and evaluation model, a behavior change model, and various content area models to plan an evidence-based intervention and evaluation design to meet a goal in a target population. Our program was geared at increasing awareness of healthy nutrition-related weight management techniques in college students using social marketing on campus.
Analysis of Isotope Levels in Sediment Samples Using a Sodium Iodide Scintillator
Eric Schaff and Levi Ekanger, Undergraduate Students, Department of Physics
Faculty Advisor: Dr. William Tireman

An experiment was conducted at Northern Michigan University in Marquette, Michigan to determine the presence of naturally occurring radioactive materials (NORMs) in sediment and soil along the Dead River Basin. Sediment and soil samples were collected from various sites along the river. The samples were then dried and sealed in Marinelli beakers to be analyzed for Cesium-137, Lead-214, and Bismuth-214 isotopes using gamma ray spectroscopy. The presence of NORMs was detected by analyzing the unique gamma rays each isotope gives off during its decay. Each sample was run in the detector for twenty hours with weekly background calibrations to subtract pre-existing gamma activity and therefore increase accuracy. Using these methods we were able to keep our uncertainty below 10% for almost all samples. After the analysis was complete the results were exported into GIS (geographic information systems) in order to find any correlations between location of the sites and NORM levels. We are still undergoing analysis and will present results on the day of the presentation.

Gamma Ray Spectroscopy Analysis of Sediment and Soil Samples in Marquette County, Michigan for Pb-214, Cs-137, and Bi-214
Brad Schoenrock, Eric Schaff, & Levi Kanger, Undergraduate Students, Department of Physics, Faculty Advisor: Dr. William Tireman,

Sediment and soil samples were collected and analyzed for naturally occurring radioactive materials (NORMs) from the Dead River in Marquette County in Michigan’s Upper Peninsula. The goal was to determine the activity of NORMs in the soil and sediment. A 2-in by 2-in NaI detector was used to obtain the gamma ray spectrum from each sample and multi-peak fitting was used to decompose the gamma ray spectrum. The measured activities of the man-made 137Cs and the naturally occurring 214Bi and 214Pb in the samples will be presented along with conclusions about their respective distribution in the search area.

Effects of Predator Scent on use of Foraging Trails by Beavers
Bill Severud, Graduate Student, Department of Biology,
Faculty Advisor: Dr. John Bruggink

American beavers (Castor canadensis) may increase their use of aquatic food over terrestrial food in response to perceived predation risk, and this may affect their relative fitness. I used a combination of Reconyx infrared cameras and Trailmaster infrared monitors to examine the effects of predator scent on foraging trail use in Seney National Wildlife Refuge in Michigan’s Upper Peninsula. Sixteen lodges with active foraging trails were selected. At each lodge, 1 trail was treated with wolf urine, while 1 was an untreated control. Camera images yielded indices of age class of beavers using the trails, and the number of crossings by beavers. Trailmasters recorded the number of crossings at each trail. My results will elucidate whether beavers avoid areas with indirect evidence of predation risk.

Exploration of Health Journalism through a Problem Based Learning for Health Professionals
Claire Smith, Undergraduate Student, Department of Health Physical Education & Recreation,
Faculty Advisor: Dr. Patricia Hogan

In an experimental Problem Based Learning (PBL) for Health Professionals class scenarios of problems one might run into in the course of his or her career were introduced. Students were tasked with selecting a health profession, researching the role of the professional, and then discussing how that profession/
professional could address the issues or problems depicted in each scenario. I chose the profession of “Health Journalist.” In this presentation I will present two scenarios (MRSA scenario and Ethics scenario), identify the problems from the perspective of a health journalist, and discuss how a health journalist could address the problems.

Irish Food and Culture
Alison Spaude, Graduate Student, Department of English, Faculty Advisor: Dr. Paul Lehmberg

In May of 2008, Alison Spaude and her partner Alan explored the food culture of the Emerald Isle. They spent three weeks eating their way through Ireland in search of a local food revolution. Some days of their journey were spent identifying the edible seaweeds off of Ireland’s coast, while other days were passed shoveling cow patties at a small family farm.

Election Issues Reported for Public Television by Members of the Politics and the Press Course
Katherine Stelmaszek, Keith Voorheis, and Jason Morgan, Undergraduate Academic Service Learning, Communication & Performance Studies & Political Science & Public Administration, Faculty Advisors: Dr. Charles Ganzert and Dr. Steven Nelson

During the fall 2008 election season, students in Charles Ganzert and Steven Nelson’s Politics and the Press course examined the type and content of political messages in the media. Afterwards, the students got first-hand experience in creating their own media content by producing a series of interview segments for Public Television about hotly contested election issues. These stories, which were produced as part of an Academic Service Learning project, aired on WNMU TV immediately before Election Day. The presentation about this work will include an explanation of how Political Science and Media Production students worked together with the television staff to write and record the stories, a video example of one of the interview segments, and a brief sample from an interactive teleconference created by students from the Politics and the Press class and their peers attending the Republican National Convention in St. Paul, Minnesota.

Increasing Fitness in Youth through Education and Training
Danielle St. Onge and Jessica Trotochaud, Undergraduate Students, Department of Health Physical Education, & Recreation, Faculty Advisor: Dr. Patti Hogan

We will be presenting a PowerPoint overview of our final in-class project for Health Program Planning and Evaluation. Our mission for our program project is to increase fitness in young people through education and training. If we were to put our program into action we would do so through the YMCA of Marquette County. We will begin by talking about the general need for young people to increase their fitness. We will theoretically define fitness and its components, as well as give a graphical depiction of the definition. We will test our subjects using a fitness and behavior change test. We will discuss the validity and reliability of our dependent variable tests and provide measurable objectives that we wish to accomplish by the end of our program to meet the need and therefore our mission. We will talk about our evaluation design, as well as discuss the different types of validity and how they relate to our program. We will give an overview of our program and the models that it was based on. We will include some of the marketing materials we would use to promote our program and finish by discussing an organization where we could apply for funding to help us implement our program.
Peak Velocity of Nordic Ski Double Pole Technique: Stand-up Skiing vs. Adaptive Sit-skiing
Jodi L. Tervo, Undergraduate Student, Health Physical Education and Recreation Department, Faculty Advisor: Dr. Randall Jensen

Double poling is a technique used in Nordic skiing and is defined as when the upper body provides most of the propulsion via bilateral pole pushes. This study compared the point that linear peak velocity of the ski occurs during the poling phase and to see if there is a difference in this point between Olympic style and Paralympic sit-ski double poling. Four female and two male collegiate athletes participated in stand-up and sit-skiing; one male and one female experienced recreational skier participated in sit-skiing, and one experienced male sit-skier participated as a subject to reference for the analysis portion of this study. All subjects arrived at an outdoor cross-country ski venue with skis, boots, and poles. Ethical approval (#HS09-242) was received prior to conduction of the study, and signed an informed consent prior to participating. Each subject had markers placed on the ski binding to allow digitization of movement. They were asked to mimic a race start using the double pole technique. The video captured a recording of at least one complete cycle of double poling. The Peak Motus System version 8.5 was used to analyze the data. The results of this study are still in progress.

Margins: Liminality and the Poetry of Place
Casey Thayer, Graduate Student, Department of English, Faculty Advisor: Dr. Austin Hummell

“Margins: Liminality and the Poetry of Place” invites listeners to consider the idea of “liminality” and how it influences poetry that chronicles America’s desire for manifest destiny and its legacy of westward expansion. A term borrowed from anthropology, notably the theories of Victor Turner, liminality defines the state of existence between two thresholds or doors. The term doesn’t simply designate physical borders but includes more metaphysical margins, such as that strange middle ground between youth and adulthood we call adolescence, or the symbol of a hotel, which stands as the liminal state between traveling and being home. Inherent in the concept of liminality is discomfort and longing for change, either back to an earlier state or to whatever comes next. During this presentation, the author will read poems that present characters caught in indeterminate states, characters who desire to move beyond the margins and borders that hold them back. Ultimately, even the style of the poems themselves will push against borders, blurring the line between lyric verse and manifesto, love letters and parable, narrative verse and religious oratory.

Ultraviolet-Visible and Fluorescent Characterization of Para-Substituted Phenylacetylenes and Novel Highly Polarized Molecules Utilizing a Propellane-Derived Linker Unit
Ivy M. Vachon, Undergraduate Student, Department of Chemistry, Faculty Advisor: Dr. Frankie McCormick

Highly polarized organic molecules have potential applications in the fields of nonlinear optics and molecular electronics. We have prepared a series of novel molecules consisting of a donor group linked to an acceptor group through a propellane spacer. The propellane spacer utilizes nonclassical conjugation to provide electronic communication between the donor and acceptor units of the molecule while maintaining transparency in the visible region. In order to characterize the electronic and optical properties of these molecules an analogous series of unlinked p-phenylacetylenes have been prepared and then studied by ultraviolet-visible spectroscopy. Multiple concentrations of each p-phenylacetylene were prepared in acetonitrile and cyclohexane, and the \( \lambda_{\text{max}} \) and \( \epsilon_{\text{max}} \) for each combination were determined. It was observed that \( \lambda_{\text{max}} \) and \( \epsilon_{\text{max}} \) showed little solvent dependence. As expected, the \( \lambda_{\text{max}} \) and \( \epsilon_{\text{max}} \)
were increased compared to the related monosubstituted benzene and to phenylacetylene. Comparison of UV-Visible spectra of the para-substituted phenylacetylenes to the propellane-derived target molecules indicates that the target molecules are polarized; the target molecules show a red shift with the $\lambda_{\text{max}}$ remaining in the ultraviolet region. Furthermore, preliminary fluorescence data show highly solvent dependent behavior for the target molecules. This dramatic solvent dependence is evidence of substantial polarization in the targets.

**Rail Capacity of Marquette County**  
Jen VanDragt, Undergraduate Student, Department of Geography,  
Faculty Advisor: Dr. Steve DeGoosh

The two current major challenges facing humankind are climate change and peak oil (the point at which the maximum level of petroleum extraction is reached and the rate of production enters a terminal decline). At the inevitable point in time when communities are forced to use less oil and more efficient transportation systems, local governments will need “shovel ready projects”. An area like Marquette, which cannot produce enough food to sustain itself over the winter, is required to import food and goods, a task requiring transportation services. By creating a methodology of mapping the current rail capacity of Marquette County, a system is created that can in turn be applied to the entire Upper Peninsula.

**Memory Enhancement Educational Intervention at Local Senior Centers: An Overview**  
Nicole S. Weber, Ashley Bollwahn, and Kady Adams, Undergraduate Students, Health, Physical Education, & Recreation,  
Faculty Advisor: Dr. Patti Hogan and Dr. Mary Jane Tremethick

Having the opportunity to implement a class project in the community provides not only the student with the opportunity for real life experience and a challenge to enhance his or her skills, but also allows for the community members to benefit from the skill sets that NMU students offer. This, in turn, provides for better relations between the university and the general public, an overall sharing of knowledge between NMU students and community members, and a greater hands-on look at the topic area. This presentation will discuss the effects achieved by implementing a three week Memory Enhancement Educational intervention in the four senior centers in Marquette County by Community Health Education students as part of the Health 367 Program Planning and Evaluation class. This implementation focused on the physical, mental, and social aspects of maintaining cognitive function among seniors. It will include a look at how the assessing, planning, implementing, and evaluating of this brain health project benefited both students and the public.

**Adult ADHD/ADD (attention deficit/hyperactivity disorder)**  
Courtney Whitfield, Undergraduate Student, Department of Economics

I will be researching adult ADHD/ADD (attention deficit/hyperactivity disorder). I will explain what exactly ADHD is and how it affects those with the disorder. I will be discussing various aspects of it such as the costs and benefits of having ADHD, how it affects those undiagnosed vs. those diagnosed, how it is treated, and how it is commonly co-morbid with other disorders. ADHD/ADD is a disorder than can negatively affect the educational, social and occupational lives of those who have the disorder. Many people go their entire lives undiagnosed with this disorder. Being well informed about ADHD/ADD help you and those around you with their condition.
A New Way of Living and Gathering: the Hiawatha Traditional Music Festival: A History
Callie Youngman, Undergraduate Student, Departments of History, Political Science and Modern Languages and School of Education,
Faculty Advisor: Dr. Gabe Logan

Contextually rare in longevity, the Hiawatha Traditional Music Festival has been a cultural fixture in the Marquette community since 1979. As is the modus operandi of traditional music, there currently stands no written history of the Festival or Hiawatha Music Co-op (HMC). Oral interviews have been conducted with founding and current (often one and the same) members of the HMC and longtime festival goers. With the hopes of preserving the integrity and spirit of the original festival, the HMC Board of Directors has given its approval and encouragement to the creation of a comprehensive history of the Festival. At the present, the project includes a chronology spanning from the inception of HMC in late 1978 to the 25th Annual festival in 2003 and explores the development of both the festival and HMC’s involvement in the Marquette community. As a directed study, archival information and photographs are currently being implemented into existing research to bolster the history project. The project will continue over the next few years as the HMC is coordinating time/space for festival-goers to submit to oral interviews at future festivals and will eventually be accessible as a legitimate historical resource for the HMC and other interested parties.

POSTER PRESENTATIONS

ASL Manual 2009: Reimagined, Redesigned and Reconstructed
Amber Baillargeon, Michelle Baxter, Elizabeth Bloomfield, Tom Brewster, Ned Davies, Meredith Gasco, Becky Grutsch, Blythe LaFayette, Paul Manninen, Jennifer Marietti, Kory Miron, Kim Strom, Jay Tomlinson, Alaina Vandezmissen, Mark Veneklase, Lloryn Walker, Academic Service Learning Undergraduates, Department of English,
Faculty Advisor: Dr. Elizabeth Monske

As an ASL project for the Center for Student Enrichment, Dr. Monske’s EN 303: Technical and Professional Writing class worked with Dave Bonsall and Katy Morrison to revise an existing ASL Faculty Development manual. By connecting our classroom with the ASL community here at NMU, we, as individuals and teams, worked on redesigning, rewriting, updating, and expanding the information to meet the needs of our ever expanding ASL faculty. During this process, we made the manual more user-friendly, accurate, and audience specific. While our class only had time to revise the faculty section of the manual, the project will eventually expand to include a student’s guide and community guide to ASL here at NMU.

Hospitality Management Facility Refrigeration Energy Audit
Bill Banks, Chris Ranta, Glenda Ross, Dennis Sabo, Climate Control Technology Students, Technology & Occupational Sciences,
Faculty Advisor: Dr. Nick Griewahn

This project is an effort by students of the climate control technology program to bring the University and the hospitality management (HM) facilities into line with industry efficiency standards and the sustainability initiatives of the Roadmap to 2015. An audit was performed on the 4 existing walk-in coolers and freezers and the energy usage data was compared to state of the art equipment to determine the length of payback and the immediate savings that would be realized by the University if the equipment was upgraded. The costs that were considered include water use, electrical power consumption, initial new equipment costs and maintenance costs. It was discovered that an updated system incorporating the newer energy efficient technologies available would pay for itself in a few years time.
Historical Documents of the Upper Peninsula: ‘Two Months in the Copper Regions’ by Charles Whittlesey
Zachary Bennett, Undergraduate Student, Department of History
Faculty Advisor: Dr. Russell Magnaghi

This semester I took part in a directed study under Dr. Magnaghi of the History Department. Over the last few months I have been going through a series of primary documents relating to the early history of the Upper Peninsula. I chose to focus on editing ‘Two Months in the Copper Regions,’ an 1846 article in the ‘Lake Superior Journal.’ The article is the account of Charles Whittlesey, who led a surveying expedition here in 1846. Whittlesey left a remarkable description for potential explorers who wished to stake their fortune in the wilderness of the Upper Peninsula. Whittlesey’s experience is also reflective of the many similar surveying expeditions of that time that facilitated the exploitation of mineral wealth in the UP. ‘Two Months in the Copper Regions’ gives the contemporary reader an unparalleled glimpse into the conditions and challenges faced by the first Americans who settled this area.

NetPIPE: Network Protocol Independent Performance Evaluator Version 5.0
Torrey Dupras, Undergraduate Student, Department of Physics,
Faculty Advisor: Dr. Troy Benjegerdes, Iowa State University

Ames Lab’s Scalable Computing Lab (SCL) created NetPIPE as a conceptually simple performance benchmark used to visually represent the bandwidth latency trade offs of high performance computer networks. The simple design allows for a single benchmark code to evaluate multiple protocols, such as ethernet, InfiniBand, and Myrinet as well as multiple Application Programming Interface (API) layers, such as Message Passing Interface (MPI), Transmission Control Protocol (TCP), and shared memory. To extend and enhance NetPIPE’s capabilities, the SCL is developing a third generation version to allow for more sophisticated user interface as well as provide rapid application development and an object-oriented design. The Python programming language has been chosen for its object-oriented nature, ability to link to the existing NetPIPE C code modules, and to leverage open source analysis and visualization frameworks, such as Pylab, Numpy, and MayaVI. The SCL used the Pylab tools to analyze a 1000 benchmark runs of the original NetPIPE 3 and the new NetPIPE 5 code. Analysis showed good statistical correlation using linear regression as well as other visual representations of plotting bandwidth versus message-size. Further research and analysis is needed to identify the cause of anomalies discovered in the results.

SNP genotyping of the common loon, Gavia immer
Julian Rowe Dupuis, Undergraduate Student, Department of Biology,
Faculty Advisor: Dr. Alec Lindsay

In the last hundred years, populations of the common loon (Gavia immer) have been in decline along the southern periphery of its range. Declining populations can often suffer from the effects of inbreeding, and evaluating the loss of genetic diversity is important for their conservation. This research describes the experimental utility and outcomes from designing inexpensive and effective protocol for genotyping loons. This protocol uses polymerase chain reaction (PCR) + restriction digestion of single nucleotide polymorphisms (SNP) in the gene encoding the laminin receptor precursor P402. Analysis of SNP genotypes from breeding birds in three geographic regions (Isle Royale National Park, northern Wisconsin and Seney National Wildlife Refuge) indicated an overall low level of inbreeding for the metapopulation, though small differences in inbreeding coefficients did exist due to population size differences.
Artistic Depiction of the Logic of a Career: Art Therapy
Michelle Ehmer, Undergraduate Student, Department of Health Physical Education & Recreation, Faculty Advisor: Dr. Patti Hogan

In HL 110, Introduction to Health and Fitness Education, the professor asked us to depict, using design ideas, the logic of a career we were interested in. This depiction (poster), called Metamorphosis, is my depiction capturing the logic of the career of Art Therapist, the career I hope to pursue.

Native Plant Research by R. Sundell: A Review
Kurt D. Frei, Undergraduate Student, Department of Biology, Faculty Advisor: Dr. Ronald Sundell

Native plants are those plants that were present before Europeans settled in Michigan in the 1700’s. Due to Michigan’s wide geographic ranges native plants are genetically different from region to region. “Locally” native plants are those that have evolved and are adapted to our local soils, climate and hydrology making them able to withstand our harsh environment. Restored native plant communities provide diverse habitats and food sources attracting a variety of native birds, butterflies, and other wildlife. Their extensive root systems and natural ability to resist most pests and diseases reduces erosion, invasive plant infestations, and the need to use harmful chemicals, thus improving soil and water quality.

Round Goby Skeletal Anatomy: Illustrations
Laura Garrison, Undergraduate Student, Department of Biology, Faculty Advisor: Dr. Jill Leonard

The Round goby is a highly invasive fish to the Great Lakes region, with relatively little known about its natural history or anatomy. As a result of the wide distribution of this fish and its threatening role to many native Great Lakes species, many researchers have taken an interest in this fish, and are in need of a reliable reference for identifying this fish. In response to this need, a series of superficial and skeletal illustrations have been created detailing key anatomical features to aid in identification of this species; these illustrations have been then organized into a website along with a brief summary of the natural history of the round goby. This website will be linked to a wildlife ecology or fisheries site in hopes of reaching the scientists who need this information.

Evaluation of waterbird diet analysis for presence of round goby associated with botulism toxicity
Nicole Griewahn, Danielle Brough, Laura Garrison, Rachel Holman, Undergraduate Students, Department of Biology, Faculty Advisor: Dr. Jill Leonard

The Fish Biology Laboratory (FBL) at Northern Michigan University (NMU) was asked to conduct gut content analyses on waterbirds collected in 2007 and 2008 from Sleeping Bear Dunes National Lakeshore (SBDNL). The 67 collected birds, representing 17 species (including loons, gulls, various ducks, and cormorants), are presumed victims of botulism toxicity and we assessed whether any of the birds were consuming either dreissenid mussels or round goby (Neogobius melanostomus) since these exotic species have been implicated in botulism die-offs in the Great Lakes. Seven easily identifiable round goby bone and otolith structures were characterized, illustrated, and used to estimate quantity and size class of gobies consumed. In our samples, 43% of birds consumed round gobies in 2007 and 88.9% of birds consumed round gobies in 2008. Birds in 2007 were not tested for botulism, but all birds from 2008 tested positive for botulism. Estimated size of round goby ranged from 24.9mm to 179.6mm. The mean size of round gobies consumed was 92.9 ± 30.7mm.
Public Opinion and Awareness Regarding Viral Hemorrhagic Septicemia in the Great Lakes
Shawn M. Hodgins, Nate Reif, Kyle Shaner, Undergraduate Students, Department of Biology, Faculty Advisor: Dr. Jill Leonard

Viral Hemorrhagic Septicemia (VHS) is a deadly fish virus discovered in the Great Lakes in 2005, but has been present since 2003 or before (Bakal 2007). The presence of VHS in the Great Lakes poses a serious threat to the health of the ecosystem. Since its discovery, efforts have been made by state departments in the Great Lakes region to stop or slow the spread of the virus. In spring of 2009, a survey was administered to approximately 500 volunteers from the general public to determine general familiarity with VHS, awareness of the policies and regulations regarding the virus, and the public’s compliance with those regulations. Among people surveyed, 43% were aware of the virus’ presence in the Great Lakes. Among those who have gone fishing in the year prior to being surveyed, 34% claimed to be aware of at least some regulations, and 86% of those aware of the regulations claim to follow them. These results indicate that although the majority of people aware of the regulations claim to follow them, more effort should be made to create public awareness of this virus’ presence to effectively slow or stop its spread.

Yield comparisons of mixed Panicum virgatum/Fetusa arundinacea crops grown in monocultures vs. mixed seed
Shawn Hodgins, Undergraduate Student, Department of Biology, Faculty Advisor: Dr. Jill Leonard

For environmental, as well as economic reasons, the need for locally grown biofuels is steadily growing. For this reason, increasing yields of crops used in making biofuels is an important goal. In this study, switchgrass (Panicum virgatum) was combined with tall fescue (Fetusa arundinacea) to determine whether planting a mixed seed could increase overall crop yield. The results showed that the mean mixed crop yield was significantly greater ($p=0.004$) when grown together, than the combined crop yield of grasses grown separately (Mann-Whitney, $\alpha=0.05$). Therefore, it is possible that mixing the seed and planting the crops together could be beneficial.

Tilings of the Plane
Barbara Homann, Renee Kivioja, and Heather Leisner, Undergraduate Students, Department of Mathematics and Computer Science, Faculty Advisor: Dr. Carol Bell

This poster session will describe the mathematics that is required to create a tiling of the plane via translation, rotation, or reflection of a fundamental region. Examples of tilings of the plane that were created by students in MA331 using the Geometer’s Sketchpad software program will be provided. Information about tilings by Escher and Penrose will also be included.

Determining ecosystem interactions of hatchery and wild Chinook salmon with stable isotopes
Rachel A. Hovel, Undergraduate Student, Department of Biology, Faculty Advisor: Dr. Jill Leonard

The Chinook salmon (Oncorhynchus tshawytscha) is a critical species to the Pacific Northwest region, both economically and ecologically. In recent decades, native Chinook salmon have experienced steep population declines, and viable fisheries are now supported primarily by supplementation with hatchery raised fish. Several wild Chinook salmon populations, including those off the Washington coast, are now listed under the Endangered Species Act, and concerns exist over the genetic and competitive effects of hatchery raised fish on native wild stocks. This study examined the impacts of aquaculture fish on wild
Chinook salmon in Skagit Bay of north Puget Sound, using stable isotope analysis to evaluate diet overlap between wild and aquaculture fish and to identify possible predation on wild fish by larger hatchery individuals. Results showed convergence in the isotope signals of the wild and hatchery fish with increase of time in the Sound and size of the fish. This finding indicates broad diet overlap in wild and hatchery fish after coexistence in Puget Sound, suggesting a possibility for competitive interaction that may have management implications for hatchery releases.

**Brook Trout Population Genetics: Subdivision among Populations in Pictured Rocks National Lakeshore**
Andrew J Jasonowicz, Undergraduate Student, Department of Biology, Faculty Advisor: Dr. Kate Teeter

The brook trout (*Salvelinus fontinalis*) is a widely distributed species native to much of eastern North America. Inhabiting a wide variety of habitats, the brook trout employs many different life history strategies. The coaster brook trout is a migratory variant native to the Lake Superior basin that utilizes the lake to forage and mature until they return to their natal stream to spawn. Brook trout migrations have been detected in three tributaries (Mosquito River, Sevenmile Creek and Hurricane River) in Pictured Rocks National Lakeshore, and individuals have also been documented using Lake Superior to move between these streams as well. This study examines the usefulness of four microsatellite loci (Sfo-8, Sfo-12, Sfo-18 and Sfo-23) in assessing the genetic relatedness of these populations. In addition to this, protocols were created for future research efforts on the genetic structure of these populations. Polymerase chain reaction (PCR) conditions were optimized for genotyping purposes at each microsatellite locus and DNA extraction procedures were modified for use with brook trout fin samples.

**Acidities of Common Beverages**
Tori LaFleur, Undergraduate Student, Department of Chemistry, Faculty Advisor: Dr. Suzanne Williams

The American Dental Association reports that the acid content of beverages may play a role in widespread dental problems such as the erosion of tooth enamel. In order to compare the acidities of beverages like flavored waters, energy drinks, milk, and beer, pH measurements were taken in the laboratory. Efforts were made to duplicate the procedures commonly performed by consumers in the home, such as the use of packets of flavored powders mixed in tap water at standard water bottle volumes. Results demonstrated a wide range of pH values, from 6.6 for milk, nearly neutral on the pH scale, to 2.5 for Rock Star Original energy drink, approaching the acidity of gastric acids.

**Enzyme Detection in the Roots of Little Blue Stem as a Possible Means of Phytoremediation**
Colleen K. Mikelson, Undergraduate Student, Department of Chemistry, Faculty Advisor: Dr. Lesley Putman

Trichloroethylene (TCE) and toluene, used in many industrial processes, are both listed on CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) Priority List of Hazardous Substances. Human exposure to both of these chemicals poses a host of confirmed and suspected health risks. Polluted soil from spills of these two chemicals may lead to contamination of underlying aquifers and drinking water wells. Preventing the percolation or downward migration of these chemicals is the aim of phytoremediation projects in which plants are used as a means of up-taking or breaking down the contaminants. Peroxidase and glutathione-S-transferase (GST) are two enzymes that are known to play a role in phytoremediation. Little Bluestem (*Schizachyrium scoparium*) was planted in soil containing TCE and toluene or in control soil, then harvested after 1, 2 and 3 days. Both peroxidase and GST
activities were present in extracts from Little Bluestem roots. An increase in the activity of these enzymes in the presence of contaminants would suggest that the plant may use these enzymes in metabolizing TCE or toluene. Little Bluestem is known to be involved in phytoremediation and this study is an effort to determine the mechanism by which it metabolizes contaminants.

**Metals Analysis of Groundwater in the Sands Plains**
Colleen K. Mikelson, Undergraduate Student, Department of Geography,
Faculty Advisor: Dr. Robert Regis

In the late 1970’s, the U.S. Geological Survey conducted a study investigating the impacts of the newly constructed Tilden iron mine tailings basin on the Sands Plains aquifer, which is the largest in Marquette County. The fine-grained waste rock, or tailings, is the by-product that is generated during the iron ore refining process. It is discharged in a slurry into a settling basin (the Gribben basin) on the western side of the Sands Plains. The hydrology of the area was the major focus of the study. Ground and surface water samples were collected and measured for water quality. From July 2008 to March 2009, 15 groundwater samples were collected from the same monitoring wells drilled for the USGS project in 1979. The samples were analyzed for metal concentration using flame atomic absorption spectroscopy. The settling basin is a potential point source for pollution, and monitoring the potential impact on ground water is critical to the health of the people living in the area.

**Program Planning and Evaluation: An Exercise Addiction Awareness Campaign**
Jayme Murray and Amanda Hagerl, Undergraduate Students, Department of Health, Physical Education & Recreation,
Faculty Advisor: Dr. Patricia Hogan

The core concept behind HL 367 is an introduction for students to the developmental steps behind designing and planning effective programs for the professional setting. Structured around the generic program planning and evaluation model, students are enabled to develop a distinct program designed toward a specific health need identified in a target population.

Utilizing the program planning and evaluation model, along with Behavior Change Models, and Health Literacy, we were able to construct an awareness program on exercise addiction specifically for women at Northern Michigan University. Our aim here is to demonstrate part of the intervention section by providing a visual example on how awareness of exercise addiction can be increased through education.

**Scale Based Age Analysis of Salmonids at Pictured Rocks National Lakeshore: A Study**
Elizabeth A. Nutt and Rachel M. Koleda, Undergraduate Students, Department of Biology,
Faculty Advisor: Dr. Jill Leonard

The scales of many species of fish display annuli, or growth rings, that indicate a period of time in which an individual is stressed. The regular presence of a stressor, such as winter, provides a series of annuli that can be used to age the individual. Scale analysis is generally deemed a reliable method of determining age, and is thought to be consistent across each of the species and rivers studied here. To test this hypothesis, the scales of 593 salmonids were examined under magnification. Those belonging to the 322 steelhead and the 181 coho were pressed between layers of acetate, while those of the 90 brook trout were placed between glass slides. The number of annuli was counted on each scale to determine the age of the fish; the age was then plotted against the length of the fish. The majority of the fish, across all rivers and species, were 2 years old or younger, although a fair number of older fish were also sampled. This suggests that the fish from the Hurricane, Mosquito, and Seven Mile rivers all aged similarly to each other.
Artistic Depiction of the Logic of a Career: Personal Training
Rosalee Rank, Undergraduate Student, Department of Health Physical Education, & Recreation, Faculty Advisor: Dr. Patricia Hogan

In HL 110, Introduction to Health and Fitness Education, the professor asked us to depict, using design ideas, the logic of a career we were interested in. This depiction (poster), called Growing too Big for your Shell, is my depiction capturing the logic of the career of Personal Trainer or Strength and Conditioning Coach.

Antigen presentation in the MHC I
Trisha Sippel, Graduate Student, Department of Biology, Faculty Advisor: Dr. Robert Winn

Antigen presenting cells within the immune system have two ways of processing foreign materials to initiate an immune response. External antigens are presented by the major histocompatibility complex II (MHC II), while internal antigens are presented by the MHC I. Presentation in the MHC I will result in the activation of cytotoxic T cells, which will then attack and kill any cells containing the foreign antigen that was presented by the MHC I. This process can be beneficial in the case of tumor antigens. If cytotoxic T cells could be activated to attack tumor antigens found on cancer cells, then these cancer cells could be eliminated by the body’s own immune system. In order for the external tumor antigen to be presented in an MHC I however, it must undergo cross-presentation. The focus of this project is to cross-present antigens from the breast cancer protein HER2 in an MHC I in order to activate cytotoxic T cells. Results from this project will provide insight for an immune based cancer treatment.

Quantation of a Soft and Hard Cuticular Proteins Affinity towards Chitin
David M. Viau, Graduate Student, Department of Biology, Faculty Advisor: Dr. John Rebers

A healthy cuticle is essential to an insect’s survival. The cuticle has many functions: it acts as an insect’s skeleton, giving it shape and allowing it to move; it also acts as its skin, providing a barrier to parasites and controlling water regulation. There are two major components to an insect’s cuticle: chitin (a structural carbohydrate) and proteins. An insect’s cuticle can be classified as either soft (flexible) like a mosquito larvae or hard (rigid) like a beetle’s wing covers, depending on the physical properties it displays. A parameter which may affect the hardness of a cuticle is the type of proteins found within the cuticle. Despite the importance of the cuticle to an insect’s survival, few studies have characterized how cuticular proteins and chitin interact. This study seeks to test the chitin binding affinity of a soft cuticular protein from the tobacco hornworm Manduca sexta and a hard cuticular protein from the African malaria mosquito Anopheles gambiae. Results from this research have the potential to elucidate strengths and weaknesses in an insect’s cuticle. This could help future researchers develop pesticides that target insects specifically by disrupting chitin/protein interactions.

Synthesis and Characterization of Polarizable, Propellane Based Molecules
David Viau, Ivy Vachon, Daniel Schwartz, Eric Schacht, Christina Boncyk, and Ashley Cole, Undergraduate Students, Department of Chemistry, Faculty Advisor: Dr. Frankie McCormick

Our research has involved improving the synthesis and characterization of a new class of transparent molecules for potential applications in electronic and nonlinear optical materials. Transparent (or non-visible light absorbing), polarized molecules are desirable for some applications, and the synthesis of such
This new class of molecules contains an electron donor unit coupled to an electron acceptor unit through a propellane spacer. The molecules are unique because the propellane spacer provides a non-traditional approach to linking the donor and acceptor units. Unlike traditional linking of polarized molecules, the propellane design allows the chemicals to be transparent while maintaining their highly polarized state. Synthesis of the molecules has involved rigorous purification of reactants and products using the techniques of flash chromatography, recrystallization, distillation, and sublimation. Characterizing the product molecules has involved the use of many spectroscopic techniques including nuclear magnetic resonance, ultraviolet-visible, infrared and fluorescence spectroscopy. We will present our progress towards the synthesis and characterization of this new class of molecules.

French Fairytale Letters
French 300 Class, Undergraduate Students, Modern Languages & Literatures, Faculty Advisor: Dr. Nell Kupper

This poster will be of the French 300 class from Fall 2008 written fairytale letters that were created for an assignment by Dr. Nell Kupper. Each letter is written in the French format and then translated in English so everyone can understand what we are saying. The letters vary from Goldilocks and the Three Bears to Little Red Riding Hood. Each student had to illustrate their favorite scene from their fairytales. These will be displayed with the letters on the posterboard.

The Battle of the Brains Faculty Blood Drive
Class Project, Undergraduate Academic Service Learning, CLS 203 Immunohematology, Faculty Advisor: Dr. Mary Stunkard

Students in CLS203, Immunohematology, partnered with the U.P. Regional Blood Center to promote and participate in a faculty-focused blood drive, entitled “The Battle of the Brains”, which challenged the “Right Brained” departments and “Left Brain” departments to a competition to see which group would donate the greatest number of units of blood.

The poster to be presented will portray the process beginning with choosing the theme, through marketing, training and finally participating in the donor screening process. It will include outcomes, graphics and reflections by students.
ART DISPLAY

Practical Theatrical Design
Stephen McClain & David Lachepelle, Undergraduate Students, Department of Communication & Performance Studies,
Faculty Advisor: Dr. Victor Holliday

This project was a scenic and lighting design on the Forrest Roberts Theatre stage for the play “The Foreigner.” Under the direction of theatre professor Paul Truckey. We designed the set and the lighting for the play.

PERFORMANCES

One World Many Drums Many Voices: a performance event on the global issue of AIDS-related stigma using dance, song, drums and visuals, directed by Maria Formolo, Graduate Student, with the modern dance class, global communication students, NMU dance club and members of local drum groups
Maria Formolo, Graduate Student, Communication & Performance Studies Department,
Faculty Advisor: Dr. Louise Bourgault

The issue of AIDS stigma is world wide and international support groups are using a variety of multi-media techniques to try to combat AIDS related stigma because it is an important co-factor in the spread of the pandemic. Such groups use dance, song, drama, i.e., performance of all types to engage audiences with the issue of AIDS. They then use the occasion to provide participants with additional information on subjects surrounding AIDS. Our piece, “One World, Many Drums, Many Voices,” was developed with Bernard Woma and the Saakumu Dance Troupe from Ghana who were in residence at NMU March 12-14. The company gave three dynamic and informative workshops for dance and percussion that formed the basis of this work. Our One World performance will serve as a vibrant opener for discussions about tolerance as well as education about AIDS and other forms of stigma. There will be a multi-media backdrop created by Michael Percy from the Global Communications class that accompanies the performance. The audience will be invited to join in a dance of life and joy at the end of the piece. We will also have flyers for people to take if they wish to find more information on various discussion AIDS and stigma-related subjects. I envision this performance will serve as the nucleus of a longer performance that will be toured to local schools. This work will also be featured in the NMU Student Dance Concert Friday April 17 at 7:00 pm and Saturday at 2:00 pm in the Dance Studio 130 PEIF.