PROGRAM AND ABSTRACTS

SYMPOSIUM ON UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

15TH ANNUAL CONFERENCE

CENTRAL WASHINGTON UNIVERSITY
ELLENSBURG, WASHINGTON

MAY 20, 2010

STUDENT UNION AND RECREATION CENTER

SPONSORED BY:
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A SPECIAL THANKS TO OUR COMMUNITY SPONSORS:
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SOURCE is partially funded by student activities fees.
HISTORY AND GOALS OF THE SYMPOSIUM

This year SOURCE celebrates the 15th year of annual multidisciplinary conferences dedicated to student scholarship at Central Washington University. In 1996, CWU sponsored the first Undergraduate Research Symposium, a showcase of faculty-mentored undergraduate student research. This event was an innovative forum for developing student scholarship that gained attention far beyond CWU. Since 1996, the undergraduate symposium expanded to include other student scholarly activity, and the broader scope was reflected in a new name in 1998, the Symposium on Undergraduate Research and Creative Expression, commonly referred to as SOURCE.

Building on the success of SOURCE, a new conference was initiated in 2002 to provide a forum for graduate students and faculty to share their scholarly work with the campus community. Originally named the First Conference of Faculty and Graduate Students Research and Scholarly Achievements, the new conference was renamed the Conference of Graduate Student and Faculty Scholarship and referred to as GSFS.

In 2005, the conferences combined to initiate the Symposium on University Research and Creative Expression, which aims to include an even wider community than either of those two previous events. The intent was to provide a forum to celebrate and share scholarship at CWU with all of the university, as well as the outside community. This is the 5th year of the Symposium on University Research and Creative Expression, which encourages students, faculty, and staff from all departments and units to participate. Contributions are collaborative or solo works involving any CWU student, faculty, or staff member. All forms of presentation of scholarly work are welcome, including oral presentations, posters, artwork, performances, and others.

Participation in the CWU conferences on scholarship has been growing. In 1996, the original Undergraduate Research Symposium had 23 presentations. This year, 304 presentations by 462 individuals: 320 undergraduate students, 92 graduate students, and 50 faculty/staff are scheduled, including approximately 148 oral presentations, 15 creative expression presentations, 141 poster presentations including 11 at satellite campuses, approximately 50 art displays, and a fashion show. Thirty-eight academic units are participating in this year’s symposium: Anthropology and Museum Studies; Asia/Pacific Studies; Art; Biological Sciences; Chemistry; Chimpanzee and Human Communication Institute; Communication; Computer Science; Douglas Honors College; Economics; Education; English; Environmental Studies; Family and Consumer Sciences; Film and Video Studies; Finance and Operations and Supply Chain Management; Geography; Geological Sciences; History; Industrial and Engineering Technology; Information Technology and Administrative Management; International Studies; Law and Justice; Mathematics; Music; Nutrition, Exercise and Health Sciences; Philosophy; Physics; Political Science; Primate Behavior and Ecology; Psychology; Resource Management; Science Education; Sociology; Theatre Arts; Wine Studies, and Women’s Studies.

We continue to welcome additional growth in numbers of presenters and participants, as well as an expanded roster of participating colleges, departments, and programs. Our vision continues to be one of creating an event showcasing all realms of scholarly work at CWU, and sharing them across disciplines and with the outside community.

STUDENT FASHION SHOW

The SOURCE fashion show is a preview of student designs from FCSA 488, Fashion Line Development. Ten students produced an apparel line of three original garments from conceptualization to completion in six short weeks. Design concepts are executed through storyboards, identification of a target market, completion of samples, fittings, and the final product. For the SOURCE show the students selected their favorite and most representative garment from their line. The final project of three original designs will be showcased at the Fashion Merchandising 14th Annual Fashion Show, Fashion Oddity on May 22 at 7 p.m. in the Milo Smith Theatre in McConnell Hall.
STUDENT ART SHOW

While you are attending SOURCE today, please plan on visiting the 2010 Student Art Show in the Sarah Spurgeon Gallery, Randall Hall. This year’s show features work from all of the disciplines in the visual arts taught at Central Washington University including photography, graphic design, ceramics, wood design, jewelry and metalsmithing, sculpture, painting, and drawing. The annual student art show celebrates the achievements of CWU’s student artists. All work in the show has been juried by a professional in the field as meritorious and worthy of the public’s attention. All Sarah Spurgeon Gallery activities are funded by the Associated Students of Central Washington University.

BIG BRASS BLOWOUT

At 7:00 p.m. in the CWU Music Building Concert Hall, the brass area of the CWU Music Department will present its annual Brass Blowout. This concert is an annual favorite, featuring student ensembles of trumpets, horns, trombones, euphoniums, and tubas playing literature from all musical style periods. The CWU Trumpet Choir, Horn Ensemble, Tuba/Euphonium Choir, Trombone Choir, and Brass Choir will all perform, along with several student chamber groups. The concert promises to have something for every musical taste, and is free and open to the public.

WINE STUDIES SPECIAL SESSION

OLD WORLD VS. NEW WORLD: A PROFESSIONAL WINE TASTING

The Global Wine Studies bachelor of science program at CWU has recently graduated students who now work in various capacities in the wine industry. One of the more important roles in the wine trade is the wine event planner. It involves planning a wine tasting around a variety of social occasions, from an anniversary to a grand opening to a cordial reception at the end of a scholarly symposium such as SOURCE. Far from being facile, the position demands a broad knowledge of wine and viticulture as well as serving etiquette and food pairing. A wine event planner’s reputation is based on the history of their past successes. Four GWS students, Alison Eglin, Rhett Humphrey, Katrina Blair, and Megan Wilke will discuss and present the tasks associated with conducting a professional wine tasting and how it differs from other wine events. The students will discuss how they chose the wines they will serve, the correct protocol and etiquette for a professional wine tasting, and the process of tabulating the tasting scores and reporting their results. This is a closed session and attendees must be 21 years or older. To attend please go to the registration desk for more information.

PROGRAM COVER DESIGN

This year’s SOURCE program cover and artistic theme, “Illuminating Minds,” was designed by graphic design undergraduate student Janie Winslow under the mentorship of Glen Bach.

PROGRAM PHOTOGRAPHY

Undergraduate student, Amanda Umberger, is the official SOURCE photographer. She has volunteered her time since 2008. She is a double major getting a BFA in Fine Art, Photography, and a BS in Information Technology & Administrative Management, Web Design. Her SOURCE 2009 pictures are seen throughout this program and on the web site.
May 20, 2010

Welcome to the 15th annual SOURCE – the Symposium on University Research and Creative Expression. Every year this event reveals the academic vigor of our programs and directly supports our university’s mission to encourage lifelong learning and to inspire intellectual depth and breadth. Today we accentuate the partnerships between our faculty, staff, and students as they show their commitment to education and to our core values of scholarly inquiry, exploration, and application.

The university community has again proven its desire to transcend its diverse scholarly activities through dissemination at SOURCE. This year there is an unprecedented level of presentations as evidenced by a 32% increase in oral presentations, a 31% increase in poster presentations and an overall increase of 23% of the number of individuals participating from just last year. Additionally, the number of creative activity performances doubled. Clearly, the energy and enthusiasm surrounding this event is contagious.

As we celebrate, we applaud our university-wide efforts which make this event possible. We acknowledge the faculty mentors who work to make a difference in students’ lives and the many faculty, staff, and administrators who volunteer their time as session judges, chairs, or facilitators. Furthermore, colleges and departmental units give financial contributions that provide a foundation for success. Sponsors include the Offices of the President, Provost, Graduate Studies and Research, and Undergraduate Studies; the Central Washington University Foundation; the Colleges of Arts and Humanities, Business, Education and Professional Studies, and the Sciences; Student Affairs and Enrollment Management; the Len Thayer Small Grants Programs; the James E. Brooks Library, the Wildcat Shop; CWU Dining Services and the Copy Cat Shop. It is wonderful to see the financial contributions from across the university; however, this year brings a new level of support from local and regional organizations as well as individual community members. Many thanks to Deborah and Roger Fouts; Kirk and Cheri Johnson; Anthony Sowards; Associated Earth Sciences; GeoEngineers; and Valley Vision Associates for investing in this generation of scholars.

Thank you for participating in SOURCE and recognizing the high-quality scholarship that CWU produces.

Sincerely,

Wayne S. Quirk, PhD
Provost and Senior Vice President for Academic Affairs
KEYNOTE ADDRESS AND MORNING RECEPTION
10:45-Noon
All are welcome for the Keynote Address in the SURC Ballroom

David Shoup

Inspirational Speaker
Freedom Personal Development
Central Washington University Alumnus

As an actor, CWU alumnus David Shoup has played everything from Captain Hook to the Sheriff of Nottingham; however, his role as a speaker with Freedom Personal Development is his most rewarding.

David’s programs-infused with humor, enthusiasm, and motivation-inspire others to maximize their potential and achieve their goals. David has traveled the world as a first-class motivator. His experience includes working with the U.S. troops in Iraq as the Morale, Welfare, and Recreation Coordinator. There he created and oversaw numerous programs designed to boost the troops’ spirits.

David will be bringing his interest to inspire to this year’s SOURCE Keynote Address.
## PROGRAM AT A GLANCE

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STUDENT UNION AND RECREATION CENTER MAP
(First Floor)
MAY 3-21
2010

RECEPTION
FRIDAY, MAY 21

6-8 PM
AWARDS CEREMONY
BEGIN AT 7PM
JARRED SPURGEON GALLERY
CENTRAL WASHINGTON UNIVERSITY
DEPARTMENT OF ART
RANDALL HALL
ON JACOB NICHOLSON BOULEVARD
FREE ADMISSION

WEEKDAYS
10AM-3PM
DAYS, 1-4PM

STUDENT ART COLLECTIVE
509-963-3137

COLLECTIONS ARE MADE POSSIBLE TO FUND, BY THE CATHOLIC ARTS COUNCIL, WITH PRODUCTION, FAN KENMAEKA, AND SUPPORTED BY THE
ASSOCIATED STUDENTS OF ART
AND THE DEPARTMENT OF ART

SAC IS AN
AFFEOIITI INDIAN INSTITUTION
108 509-963-2149

sarah spurgeon
GALLERY
ORAL PRESENTATION SCHEDULE

Only authors are listed for each paper/poster. Mentors are shown in the ABSTRACT portion of this program.

MORNING ORAL PRESENTATION SESSIONS

SESSION 1: GEOLOGICAL SCIENCES
ROOM: SURC 135

8:00 DUCTILE DEFORMATION PATTERNS IN THE LOWER PLATE OF THE NORTHERN SNAKE RANGE DETACHMENT: DEFORMATION TEMPERATURE, VORTICITY, QUARTZ C-AXIS FABRICS, AND FINITE STRAIN STUDIES
Dermond, Jeffrey

8:20 CRUSTAL THICKNESS OF THE MARIE BYRD LAND DOME AND ITS IMPLICATIONS
Svaldi, Josh

8:40 THE LACUSTRINE SEDIMENT RECORD AND GEOMORPHOLOGY OF THE WEST CRATER LAVA DAM ON THE OWYHEE RIVER, SOUTHEASTERN OREGON
Orem, Caitlin

9:00 FLUID BUDGET OF METASEDIMENTARY ROCKS ON THE OLYMPIC PENINSULA AND CONNECTIONS TO SEISMICITY: GEOCHEMICAL, PETROGRAPHIC, AND ISOTOPIC INSIGHTS
Rotman, Holly; Mattinson, Chris

SESSION 2: PHYSICS
ROOM: SURC 137A

8:00 AN ANALYSIS OF A CHAOTIC THIRD ORDER DIFFERENTIAL EQUATION
Hudson, Chris

8:20 EFFICIENCY OF A MODEL STIRLING ENGINE USING LIQUID NITROGEN
Hagemeier, Nathan

8:40 ENERGY CONVERSION EFFICIENCY OF SOLAR POWER IN A CWU RESIDENCE HALL
Taylor, Robert

9:00 THE DEVELOPMENT OF A COMPUTER MODEL OF SHELL RESONANCES AS A TOOL FOR NONINVASIVELY MONITORING INTRACRANIAL PRESSURE CHANGES
Abdul-Wahid, Sami

SESSION 3: THEATRE ARTS/FILM STUDIES
ROOM: SURC 137B

8:00 GARAGE THEATRE: A RETROSPECTIVE LOOK AT STUDENT PRODUCED THEATRE
Carter, Andrew

8:20 WHO IS THAT GIRL WE SEE? WESTERN IDENTITY AND TELEOLOGICAL JOURNEY IN DISNEY’S MULAN
Strom, Christopher

8:40 RELIGION IN ICONOGRAPHY AND THEME IN THE HORROR PICTURE
Stoops, Scott
SESSION 4: CHEMISTRY
ROOM: SURC 140

8:00  DI(2-ETHYLHEXYL) PHTHALATE (DEHP) AS A POTENTIAL INHIBITOR OF THE MITOCHONDRIAL ELECTRON TRANSPORT CHAIN
Fowler, Eric

8:20  SYNTHESIS OF NOVEL STRAIGHT CHAIN BORINIC ACIDS AS POTENTIAL HIV-1 PROTEASE INHIBITORS
Clayton, Donald

8:40  SYNTHESIS TOWARDS 1,3-AZABORINES AS POTENTIAL NOVEL INHIBITORS OF HIV-1 PROTEASE
Nye, Jesse

SESSION 5: MATHEMATICS/COMPUTER SCIENCE
ROOM: SURC 201

8:00  A MODEL FOR CONSTRUCTING THE GEOGRAPHICAL PROFILE OF A SERIAL KILLER
Kastning, Mary; Dinescu, Monica; Ellis, Jesse

8:20  USING DATA MINING WITH JUVENILE ARREST RATE DATA
Gerstman, Nathan

8:40  RADIO ANALYSIS: SONG SPINS VERSUS BURNOUT
Cleveland, Alisha

9:00  CREATING MATH E-BOOK FOR STUDENTS WITH DISABILITES
Greear, Krista; Wahle, Ellora

SESSION 6: WATER RESOURCES IN CHINA
ROOM: SURC 202

8:00  REDRAWING AGRICULTURAL-PASTORAL BOUNDARIES: THE EFFECTS OF P.R.C. WATER AND AGRICULTURE DEVELOPMENT POLICIES IN XUNHUA COUNTY
Huls, Derek; Janke, Mark; Gallardo, Yesenia

8:20  CHINA’S WILD WEST: THE LAST ECONOMIC FRONTIER
Reddick, Jeremy; Bennett, John Paul; Cunningham, Samantha

8:40  GREAT WESTERN DEVELOPMENT, RURAL PEASANTS AND WATER POLICY IN NORTHWEST CHINA: A CASE STUDY ON WATER RESOURCE MANAGEMENT IN QINGHAI AND GANSU
Hagen, Mikaela; Tollefson, Deanna; Armantrout, Jessica

9:00  DEEP ECOLOGY IN SHALLOW WATERS: ENVIRONMENTAL PROBLEMS AND THEIR SOCIETAL EFFECTS IN NORTHWESTERN CHINA
Anderson, Tyler; Scalora, Alina; Schmidt, Alex
SESSION 7: SOCIOLOGY
ROOM: SURC 135

9:30  SOCIALIZATION OF GUILT ANALYSIS
      Gomez, Cornelio

9:50  HOLLYWOOD FILM ACTOR NETWORKS
      Johnson, Daniel

10:10 CELL PHONE NETWORKS
      Johnson, Daniel

10:30 CULTURE & CLIMATE CHANGE: HOW CHANGING VALUES CHANGE THE CLIMATE ON A GLOBAL SCALE
      Baker, Kiley

SESSION 8: HISTORY/INTERNATIONAL STUDIES/LAW AND JUSTICE
ROOM: SURC 137A

9:30  U.S. DOMINATION THROUGH THE FEMINIZATION OF LATIN AMERICA: A STUDY OF POLITICAL CARICATURE
      Bator, Jeanine

9:50  THE IRANIAN CIVIL RIGHTS MOVEMENT AND FUTURE OF THE ISLAMIC REPUBLIC
      Kaviani, Khodadad (Khodi)

10:10 KITTITAS COUNTY POLITICS: THE TRIUMPH OF CONSERVATISM
      Ward, Randall

10:30 PERCEPTIONS OF GUN CONTROL AFTER PRESIDENT OBAMA'S ELECTION
      Morgan, Colleen

SESSION 9: THEATRE ARTS
ROOM: SURC 137B

9:30  THE INTRODUCTION OF WOMEN TO COMMEDIA DELL'ARTE: A BUSINESS VENTURE?
      Assaf, Sahar

9:50  REFORMS OF THE WANDERING THEATRE TROUPES IN EIGHTEENTH CENTURY GERMANY
      Bell, Maggie

10:10 THE ITALIAN INFLUENCE ON THE SHIFT FROM CORRALES TO COURT THEATRE IN SPANISH GOLDEN AGE THEATRE
      Pierson, Kate
SESSION 10: ENGLISH
ROOM: SURC 140

9:30  PRAXIS CONTRA DOXA: ANTI-AUTORITARIANISM IN “CECELIA DE NOEL”  
      Martinson, Matt

9:50  THE CULTURAL ERASURE OF INDIA IN TWO ANGLO-INDIAN GHOST STORIES  
      Tonnemaker, Heather

10:10 POWERFUL SPECTERS: WOMEN AND GHOSTS LEAVING THE FRINGES IN REALITY  
      AND FICTION  
      La Paz, Ana

10:30 THE SENSATION OF THE MASCULINE IN WILKIE COLLINS’ THE WOMAN IN WHITE  
      Brandon, Chelsea

SESSION 11: INDUSTRIAL ENGINEERING TECHNOLOGY
ROOM: SURC 201

9:30  ASSESSING THE GREENHOUSE GAS IMPACT OF CWU  
      Beardsley, Roger

9:50  USING A CAMERA VISION SYSTEM TO CONTROL AN AUTONOMOUS VEHICLE  
      Grunwald, Corbin; Jones, Timothy

10:10 DESIGN AND TESTING METHOD FOR AN IMPROVED ANTI-ROLL BAR  
      Jones, Jorday

10:30 DESIGN, IMPLEMENT, AND TEST A CONTROL-SYSTEM FOR A SCANNING TUNNELING  
      MICROSCOPE USING LABVIEW  
      Hobbs, Christopher

SESSION 12: MANASTASH
ROOM: SURC 202

9:30 - MANASTASH SHOWCASE
      Whitcomb, Katharine; Dykes, Ashley; Cavazos, Pedro; Milne, Stefan; Grogan, Ben; Norris, Lisa;  
      Powell, Joseph

SESSION 13: ITAM/MANAGEMENT
ROOM: SURC 301

9:30  SHOPPING ALTERNATIVES: HOW ELLENSBURG CLOTHING RETAILERS ARE AFFECTED BY  
      STUDENT BEHAVIORS  
      Frauen, Shiloh; Phipps, Erika; Smith, Ashley

9:50  AN INVESTIGATION OF HOW CWU FINANCIAL AID STUDENTS SPEND THEIR REFUND  
      CHECKS  
      Moore, Tiffany; Reimer, David; Wagner, Kevin; Cook, Lindsay

10:10 THE SCIENCE OF CLOTHING–WHY PEOPLE DRESS ACCORDING TO THEIR LIFESTYLE  
      Dyer, Carlie; Hahn, Whitney; Giannandrea, Ashley

10:30 VALUE OF ATHLETICS AT CENTRAL WASHINGTON UNIVERSITY  
      Winter, Tim; Ravnik, Andrea; Serhiyevich, Alena; Chandley, Josh; Ehling, Justin
ORAL PRESENTATION SCHEDULE

Only authors are listed for each paper/poster.
Mentors are shown in the ABSTRACT portion of this program.

AFTERNOON ORAL PRESENTATION SESSIONS

SESSION 15: COMMUNICATIONS/RESOURCE MANAGEMENT
ROOM: SURC 135

12:00  IDENTIFYING ADVANCED CHARACTERISTICS USING MMORPGS
       Miller, Aaron

12:20  REDUCING FEAR: TIPS FOR REDUCING APPREHENSION FROM AN APPREHENSIVE STUDENT’S POINT OF VIEW
       Eglin, Alison; Wheeler, Caleb; Hall, Jessy; Hargrave, Elizabeth; Smith, Jinah; Wells, Sean

12:40  BACKCOUNTRY CAMPSITES AT WAPTUS LAKE, ALPINE LAKES WILDERNESS, WASHINGTON: CHANGES IN SPATIAL DISTRIBUTION, IMPACTED AREAS, AND USE OVER TIME
       Batura, Darcy

1:00   TOWARD SUSTAINABLE WATER RESOURCE MANAGEMENT IN GHANA: A CASE STUDY FROM THE BIRIM RIVER BASIN
       Adjepong, Godfried

1:20   SUSTAINABILITY POLICY: CRAFTSMANSHIP AND/OR DUPERLICY IN LAS VEGAS
       Zimmerman, Kathryn

SESSION 16: BIOLOGY
ROOM: SURC 137A

12:00  GENETIC DIVERSITY OF WATER MOLDS: WHAT’S INFECTING AMPHIBIAN EGGS?
       Ault, Kori; Wagner, Steve; Johnson, James

12:20  MOLDY FROG EGGS: WHO’S THE REAL CULPRIT?
       Brady, Susan; Johnson, James; Wagner, Steve; Selski, Dan

12:40  ANALYSIS OF AQUATIC INSECT COLONIZATION AND DRIFT CHARACTERISTICS ON THE WILSON CREEK RESTORATION PROJECT
       Hatch, Kyle

1:00   EVALUATION OF THE FISH COMMUNITY WITHIN A NEWLY RESTORED SECTION OF WILSON CREEK ON THE CWU CAMPUS
       Beals, Tyler

1:20   LONGITUDINAL PATTERNS OF AQUATIC HABITAT INFLUENCING BULL TROUT SPawning SITE SELECTION IN TWO STREAMS OF THE YAKIMA RIVER BASIN, WA
       Lamperth, James; James, Paul
SESSION 17: HISTORY
ROOM: SURC 137B

12:00  BABA YAGA, VASILISA, AND THE ENDURING POWER OF THE MOTHER: HISTORICAL ROOTS OF THE RUSSIAN FOLKTALE BABA YAGA AND VASILISA THE BEAUTIFUL
Wildes, Sheena

12:20  ALCOHOLIC DEPENDENCY: STATE AND CHURCH DOMINATION OF ALCOHOLIC BEVERAGES IN MUSCOVITE RUSSIA
Bailor, Karen

12:40  KITTITAS COUNTY PUBLIC HISTORY PROJECT
D’Amico, Tony

1:00  LADIES, GENTLEMAN, AND LIBEL: IMPERIAL DIMENSIONS OF CIVILITY AND GENDER IN THE VICTORIAN PRESS
Willden, Andrew

1:20  AMERICANIZING THE SPICE ISLE’S SCHOOLS: EDUCATIONAL DEVELOPMENT IN POST-INVASION GRENADA
Zakula, Robert

SESSION 18: ENGLISH
ROOM: SURC 140

12:00  JAPANESE INTONATION AND TRANSFER
Kjeldgaard, Marie

12:20  PATTERNS OF SENTENCE STRESS IN THE ENGLISH OF JAPANESE SPEAKERS
Tulluck, Marco

12:40  EFFECTS OF TEXT VARIATION ON L2 PRONUNCIATION
Moshier D.A., Laurie

1:00  EFFECTS OF KURDISH STRESS PATTERNS ON ORAL PRODUCTION OF KURDISH LEARNERS OF ENGLISH
Almas, Khasrow

1:20  NON-NATIVE ENGLISH SPEAKER STRESS PATTERNS AND EFFECTS ON NATIVE SPEAKER INTELLIGIBILITY
Martinez, Jacqueline

SESSION 19: PHILOSOPHY/WOMEN’S STUDIES
ROOM: SURC 201

12:00  BAHÀ’I CONSULTATION: ANSWERING FEMINIST EPISTEMOLOGISTS’ OBJECTIONS TO PRAGMATISM
Dickinson, KathyMae

12:20  GENDER REPRESENTATION: WOMEN IN INTERACTIVE ELECTRONIC ENTERTAINMENT
Davis, Monica

12:40  THE SUBLIMITY OF ACHILLES: THE FAILURE OF SINGULAR SUBLIME FEELINGS
Downes, Phillip

1:00  INMATE OTHERNESS: HOW SOCIETY CONSTRUCTS MONSTERS
Keeney, Joe

1:20  SELF-RELIANCE AND THE FRONTIER MYTH AS DISPLAYED IN COMIC BOOK FILMS OF THE PAST DECADE
Candella, Jimmy-Dean
SESSION 20: POLITICAL SCIENCE/ECONOMICS
ROOM: SURC 202

12:00  TO SAVE OR TO SPEND?
       Harrison, Isa

12:20  NAFTA AND ITS EFFECTS ON THE ENFORCEMENT OF LAW AND INTERNATIONAL
       TRANSPORT AT THE U.S./MEXICO BORDER: A POLICY ANALYSIS
       Davis, Perris

12:40  SHORT FALLS OF FEDERAL FINANCIAL AID
       Ponce de Leon, Anthony

1:00  ACTIONS AND STEPS TO RESOLVE A RISING VETERANS UNEMPLOYMENT RATE
       Goehner, Chris

SESSION 21: INFORMATION TECHNOLOGY AND ADMINISTRATIVE MANAGEMENT
ROOM: SURC 301

12:00  AN EXPERIMENTAL TEST FOR THE HYBRID EDUCATION MODEL FOR INTRODUCTORY
       BUSINESS COURSES AT SMALL LIBERAL ARTS INSTITUTIONS
       Takei, Hideki; Trumpy, Robert; Wang, Fen

12:20  MARKETING AND PROMOTIONAL ACTIVITIES OF THE UNITED STATES BEER INDUSTRY IN
       IRELAND
       Schoeler, Michael

12:40  INVESTIGATING THE CONSUMER’S CHOICE OF USING REUSABLE WATER BOTTLES OVER
       DISPOSABLE WATER BOTTLES
       Lee, Reda; Campbell, Katie; Floyd, Fawn; Kamalsah, Angie

1:00  PERCEPTION AND IDENTIFICATION OF ELLensburg BUSINESS LOGOS
       Greenfield, Vanessa; Guild, Amy; Mackie, Sammie Jo

1:20  THE IMPACT OF ENVIRONMENTAL FACTORS ON THE STUDIO PHOTOGRAPHY INDUSTRY
       Anderson, Angela; Musse, Mohamed

SESSION 24: SOCIOLOGY/PSYCHOLOGY/NUTRITION
ROOM: SURC 135

1:50  THE EFFECTS OF PLANNING AND TELLING LIES ON MEMORY FOR THE TRUTH
       Polage, Danielle

2:10  BATTLE OF THE SEXES: ACTUAL 3D OBJECTS IN A MENTAL ROTATION TASK REVEALS A
       PERFORMANCE INCREASE FOR BOTH SEXES
       Felix, Michael

2:30  TARGET VULNERABILITIES AND LIVING WAGE CAMPAIGN OUTCOMES IN U.S. CITIES,
       1994 – 2003
       Mulcahy, Michael

2:50  ETHNIC TERROR IN THE PACIFIC NORTHWEST
       Peterson, Anthony

3:10  A COMPARISON OF TWO GLUCOSE MONITORING METHODS DURING SUBMAXIMAL
       EXERCISE
       Herrington, Stefanie; Pritchett, Kelly; Dow, Shireen; Monosky, Keith; Gee, David
SESSION 25: BIOLOGY
ROOM: SURC 137A

1:50  CHARACTERIZATION OF ELECTROTAXIS BEHAVIOR IN CAENORHABDITIS ELEGANS
      Chrisman, Steven

2:10  A WHOLE PLASTOME APPROACH TO INFERRING THE RELATIONSHIPS IN THE
      ARACARIAECEAE
      Mei, Wenbin; Smith, Daniel; Chumley, Timothy

2:30  PODOCARPACEAE PHYLOGENY: EVIDENCE FROM THREE EVOLUTIONARY PERSPECTIVES
      Owart, Birkin; Phipps, Erika

2:50  METABOLIC DEPRESSION AND SEASONAL VARIATION IN SUPERCOOLING POINT IN THE
      MOUNTAIN PINE BEETLE, DENDROCTONUS PONDEROSAE
      Lester, Jack

3:10  WASP’S IT ALL ABOUT?: EVERYTHING I’VE LEARNED ABOUT LOCAL YELLOWJACKETS
      AND PAPERWASPS THAT’S ACTUALLY INTERESTING!
      Corrigan, Shawn

SESSION 26: WENAS CREEK MAMMOTH
ROOM: SURC 137B

1:50  INTRODUCTION TO THE WENAS CREEK MAMMOTH SYMPOSIUM
      Lubinski, Patrick

2:10  ARE THEY REAL? A DISCUSSION OF THE WENAS CREEK MAMMOTH LITHICS
      Lubinski, Patrick; McCutcheon, Patrick; Terry, Karisa

2:30  MITOCHONDRIAL DNA ANALYSIS OF PALEO-FAUNAL REMAINS: THE APPLICATION OF DNA-
      BARCODING TO SPECIES IDENTIFICATION AT THE WENAS CREEK MAMMOTH SITE
      Lorenz, Joseph

2:50  WENAS CREEK MAMMOTH CASTING PROJECT
      Keller, Alfred

3:10  UNEARTHING A MAMMOTH, FINDING A STORY: DOCUMENTING THE WENAS CREEK
      MAMMOTH PROJECT
      Ogden, Michael

SESSION 27: ENGLISH
ROOM: SURC 140

1:50  HOW NOT TO LOVE: CHAUCER’S GUIDE FOR LOVERS
      Wildes, Sheena; Higgs, Kathryn

2:10  MARRIAGE AND EQUALITY IN CHAUCER’S “WIFE OF BATH”
      Huss, Kathryn

2:30  THOMAS MORE: AN ACCIDENTAL FEMINIST
      Riley, Allison

2:50  WOMEN IN SIR GAWAIN AND THE GREEN KNIGHT AND LANVAL: VOICING THE FEARS OF
      THE FALL OF ARTHUR AND HIS COURT
      Hassouneh, Suhaila

3:10  THE OTHER GOLD STANDARD: A LITERARY EXPLORATION OF HUMAN MONETARY VALUE
      Sanford, Janna
SESSION 28: CHIMPANZEE AND HUMAN COMMUNICATION INSTITUTE
ROOM: SURC 201

1:50  
**USE OF HOLIDAY RELATED SIGNS BY A CROSS-FOSTERED CHIMPANZEE**  
Gibbons, Janie; Leake, Madeline; Potosky, Robin

2:10  
**VOCABULARY GROWTH IN ADULT CROSS-FOSTERED CHIMPANZEES**  
Metzler, Deborah; Jensvold, Mary Lee; Fouts, Deborah; Fouts, Roger

2:30  
**RECENT PATTERNS OF LANGUAGE IN ADULT CHIMPANZEES USING AMERICAN SIGN LANGUAGE**  
Zager, Lindsay; Bismanovsky, Daniella; Pewitt, Reese

2:50  
**DAILY AROUSAL LEVELS’ EFFECT ON A CHIMPANZEE’S CATEGORICAL SIGN USAGE**  
Cole, Melissa; Herigstad, Tracy

3:10  
**USE OF MODULATION IN RESPONSE TO REQUESTS FOR CLARIFICATION IN CHIMPANZEES (PAN TROGLODYTES)**  
Potosky, Robin

SESSION 29: CHEMISTRY
ROOM: SURC 202

1:50  
**CHARACTERIZATION OF GEL-TYPE ZINC SULFIDE QUANTUM DOT SENSITIZED SOLAR CELLS**  
Alman, Adam

2:10  
**ZINC SULFIDE QUANTUM DOT PHOTO-ELECTRIC PROPERTIES**  
Andrew, David

2:30  
**INVESTIGATION OF SURFACTANT & POLYELECTROLYTE SOLUTIONS INTERACTIONS WITH WATER-SOLUBLE ORGANIC COMPOUNDS AND SUBSEQUENT ADSORPTION OF THE COMPLEX ONTO THE SURFACE OF TITANIUM DIOXIDE**  
Best, Brittany; Scheffelmaier, Ryan

2:50  
** ADSORPTION THERMODYNAMICS OF POLY(SODIUM 4-STYRENE SULFONATE) ON TIO2 SURFACE**  
Wirth, Mark

SESSION 30: INFORMATION TECHNOLOGY AND ADMINISTRATIVE MANAGEMENT/WINE STUDIES
ROOM: SURC 301

1:50  
**THE DENIM CONSUMER: FASHION OR CONVENIENCE?**  
Helms, Danielle; Smith, Kara; Rushton, Diana

2:10  
**COMPARATIVE ANALYSIS OF INTERNATIONAL VENDING MACHINE RETAILING: USA VS. JPN**  
Bantog, Michael; Becker, Sana; Hewitt, Torey

2:30  
**AN INVESTIGATION OF UNIVERSITY STUDENTS’ GROCERY STORE PREFERENCES AND VARIABLES WHICH AFFECT THOSE PREFERENCES**  
Sewell, Katelyn; Biggs, Amanda

2:50  
**SOLUTIONS FOR RATING WINE FAULTS**  
Hudelson, John
SESSION 32: EDUCATION
ROOM: SURC 135

3:40  INDIGENOUS LANGUAGE AND CULTURE IN THE MAINSTREAM CLASSROOM
      Balmforth, Lillian

4:00  BILINGUAL EDUCATION, LANGUAGE AND LITERACY ENGAGEMENT
      Lea, YiShan; Brook, Kira; Labovitch, Hannah; Lee, April; Balmforth, Lillian; Ramirez, Aldo

4:20  A DISCUSSION OF THE MENTAL HEALTH OF PUBLIC SCHOOL TEACHERS
      Ballou, Gary

4:40  INCREASING TEACHERS’ SENSITIVITY TO THEIR MUSLIM STUDENTS
      Ross, Molly

5:00  “A PICTURE IS WORTH A THOUSAND WORDS” – HIGHLY EFFECTIVE VISUAL AND
      LANGUAGE ARTS TEACHING APPROACHES
      Donahoe, Susan; LaBrant, Natalia; Richter, Constance; Weller Natalie

5:20  ASSESSING THE PRE-SERVICE TEACHER
      Jones, Kim

SESSION 33: BIOLOGY
ROOM: SURC 137A

3:40  ALTITUDINAL VARIATION OF FREEZE TOLERANCE IN THE PACIFIC CHORUS FROG,
      PSEUDACRIS REGILLA
      Healas, Sara

4:00  SEASONAL MOVEMENTS AND OVERWINTERING OF WESTERN TOADS (BUFO BOREAS)
      Palmeri-Miles, Amber

4:20  THE ROLE OF ARGinine VASOTOCIN DURING FREEZING OF THE PACIFIC TREE FROG
      Pense, James

4:40  AMPHIBIANS AND ROADS: PREVENTING CROAKING TOADS
      Lester, Michelle; Barreca, April; Brady, Susan

5:00  SEX DIFFERENCES IN FREEZE TOLERANCE AND CRYOPROTECTANT MOBILIZATION
      OF SPRING PEEPERS (PSEUDACRIS CRUCIFER) AND WESTERN CHORUS FROGS (P.
      TRISERIATA)
      Irwin, Jason; Finkler, Michael
SESSION 34: DOUGLAS HONORS COLLEGE
ROOM: SURC 137B

3:40 NO ‘LIKE CONSORT’ NO TRUE PARADISE: HOW MILTON’S MISOGYNY UNDERMINES HIS THEODICY
Wildes, Sheena

4:00 WOLLSTONECRAFT AND ORIENTALISM: AN IMPORTANT FLAW IN THE WORK OF A FEMINIST PIONEER
Thomas, Nathan

4:20 THE ETHICS OF AUTHORITY
Moceri, Mike

4:40 CLOTHING AND CLASS RESTRICTION IN MEDIEVAL AND RENAISSANCE ENGLAND AS OBSERVED BY GEOFFREY CHAUCER AND WILLIAM SHAKESPEARE
Frauen, Shiloh

5:00 SHAKESPEARE IN POPULAR CULTURE: TEACHING THE BARD AS A CULTURAL NECESSITY
Griffin, Pearl

5:20 AN ANALYSIS OF THE PROGRESSION OF IDEAS AND AN ARGUMENT ON THE IMPORTANCE OF EDUCATION IN THE GREAT BOOKS
Lehrman, Nathan

SESSION 35: ENGLISH/FILM AND VIDEO STUDIES
ROOM: SURC 140

3:40 BURIED IN BEAUTY: SEEKING LOLITA IN TEXT, IMAGES, AND INTERPRETATION
Johnson, Joseph

4:00 “CELILO” AND OTHER POEMS
Nelson, Jessica

4:20 SURGERY, SOUL, AND POETICS: HOW POETRY SAVED MY LIFE FROM THE TRAUMA OF CHILDHOOD MOLESTATION
Cavazos, Pedro

4:40 NEW VALUES, NEW IDENTITIES: SECOND LANGUAGE LEARNERS IN THE ENGLISH COMPOSITION CLASSROOM
Brooks, Katie
SESSION 36: PRIMATE BEHAVIOR AND ECOLOGY
ROOM: SURC 201

3:40  EFFECTS OF TREE CHARACTERISTICS ON SLEEPING TREE CHOICE IN BORNEAN AGILE GIBBONS (HYLOBATES ALBIBARBUS)
Rinear, John; Sheeran, Lori; Cheyne, Susan

4:00  OF CHIMPANZEESES, BONOBOES, NEANDERTALS AND HUMANS: USING MITOCHONDRIAL DNA VARIATION TO IDENTIFY SPECIES BOUNDARIES
Ream, Candance

4:20  MATERNAL STRESS AND INFANT ATTACHMENT IN FREE LIVING TIBETAN MACAQUES (MACACA THIBETANA) AT MT. HUANGSHAN, CHINA
Hall, Brian; Sheeran, Lori; Matheson, Megan; Wagner, Steve; Li, Jin Hua

4:40  THE INFLUENCE OF AFFILIATIVE RELATIONS ON COPULATION BEHAVIORS OF TIBETAN MACAQUES (MACACA THIBETANA)
Ginn, Laura; Sheeran, Lori; Matheson, Megan; Li, Jin Hua; Wagner, Steve

5:00  TOURIST DENSITY AND INFANT-DIRECTED AGGRESSION IN TIBETAN MACAQUES (MACACA THIBETANA) AT MT. HUANGSHAN, CHINA
Self, Sydney; Matheson, Megan; Li, Jin Hua; Harding, Sarah; Pelton, Oland, Wagner, Steve

5:20  AGE AND SOCIABILITY IN FREE-LIVING TIBETAN MACAQUES
Sheeran, Lori; Matheson, Megan; Li, Jin Hua; Wagner, Steve

SESSION 37: CHEMISTRY
ROOM: SURC 202

3:40  PREPARATION AND CHARACTERIZATION OF A DERIVATIZED SILICA GEL
Nye, Patrick

4:00  BINDING OF SULFANILAMIDE TO DERIVATIZED SILICA GEL
Marston, Brian

4:20  LIGAND EFFECTS ON THE STRUCTURES AND ENERGIES OF SILICON NANOCLOUSTERS
Shore, Thomas; Ge, Yingbin

4:40  CHARACTERIZATION OF PHYTOCHEMICALS ISOLATED FROM DALEA FORMOSA (FABACEAE) FOR COMBATTING FUNGAL MULTIDRUG RESISTANCE
Schreiber, John; Eisenberg, Victoria; Kolaczkowski, Marcin

5:00  INVESTIGATING THE FUNCTION OF GD³⁺ IN (Y,GD)BO₃:EU³⁺ THROUGH TRANSFER EFFICIENCY MEASUREMENTS
Rabinovitz, Rosa
POSTER PRESENTATION SCHEDULE

Only authors are listed for each paper/poster. Mentors are shown in the ABSTRACT portion of this program.

UNIVERSITY CENTERS

CWU-DES MOINES
Posters on display May 18 at CWU-Des Moines –Noon to 6 p.m.
Second Floor Lobby of Building 29 - CWU/HCC Higher Education Building

1. THE STRENGTH OF A SMILE: THE EFFECT OF DUCHENNE SMILES ON CONSUMER PERCEPTIONS OF ADVERTISEMENTS
   Scanlon, Anne; Polage, Danielle

2. DARK LOYALTIES: A STUDY OF CHANGES OVER TIME IN SUBCULTURE IDENTIFICATION
   Hanscom,, Michael

CWU-LYNNWOOD
Posters on display May 20 at CWU-Lynnwood - 5:30 p.m. to 8:00 p.m.
First Floor Lobby of Snoqualmie Hall

1. TULLY’S COFFEE CORPORATION
   Tran, Thinh

2. IMPROVING COSTS WITHOUT SACRIFICING THE QUALITY
   Valentine, Alienor; Boivin, Alan; Marx, Chelsea

3. QUALITY IMPROVEMENT
   Pham, Mai

4. OSC 324 QUALITY IN APPRAISAL SERVICES
   Nur, Nader; Thome, Dylan; Sunito, Wahyu

5. CENTRAL WASHINGTON UNIVERSITY’S GRADUATION PROCESS
   Ingersol, Daniel; Lass, Brain; Melton, Jason; Hung, Ma

6. MEMBER RETURNED MAIL PROCESS
   Smith, Rick; Starr, Theresa; Hahgi, Saba

7. CLEARWIRE CORPORATION QUALITY MANAGEMENT RESEARCH
   Nguyen, Tony; Maruyama, Reo

8. UNITED PIPE & SUPPLY
   Dahl, Alex; Stevens, Mark

9. GENERAL MOTORS
   Tee, Ryan; Gonawan, Lucas; GuoMing Yang
POSTER PRESENTATION SCHEDULE

Only authors are listed for each paper/poster. Mentors are shown in the ABSTRACT portion of this program.

MORNING POSTER PRESENTATIONS, SESSION 40
BALLROOM

Posters on display from 8:00 a.m. -10:50 a.m.
Presenters must be by posters during judging from 9:30 a.m. -10:50 a.m.

WATERS
(NSF-FUNDED GRANT: WATERSHED ACTIVITIES TO ENHANCE RESEARCH IN SCHOOLS)

1. A JOINT PARTNERSHIP: EHS AND CWU WORKING TOGETHER TO INVESTIGATE NITRATE POLLUTION IN WET DEPOSITION IN THE ELLENSBURG AREA
   Best, Brittany; Hodges, Dave; Hutzenbiler, Brandon; Seely, Tirra

2. A JOINT PARTNERSHIP: EHS & CWU WORKING TOGETHER TO INVESTIGATE ATMOSPHERIC NITRATE POLLUTION IN THE ELLENSBURG AREA
   Best, Brittany; Smart, Joelle

3. YAKIMA WATERSHED DAM PROJECT
   Markley, Chris; Ely, Lisa; Richardson, Brian

4. ELLENSBURG STORMWATER MITIGATION IDEAS FROM THE 5TH GRADE--MOUNT STUART ELEMENTARY AND CWU YAKIMA WATERS
   Nagorsen, Sarah; Brammer, Cynthia; Pratt-Sitaula, Beth; Hackett, Jennifer

5. TO BE OR NEOTENY, THAT IS THE QUESTION
   Lester, Michelle; Wagner, R. Steven; Rice, Tyler

6. FOSTERING A SENSE OF PLACE AT WALTER STROM MIDDLE SCHOOL: PROGRESS OF THE YAKIMA WATERS PROJECT IN THE CLE ELUM/ROSLYN SCHOOL DISTRICT
   Dilworth, Erin; Browitt, Lisa; Griswold, Trish; Gabriel, Anthony; Cordner, David

7. FOSTERING A SENSE OF PLACE AT WALTER STROM MIDDLE SCHOOL: SEVENTH GRADE OUTDOOR RESEARCH PROJECTS
   Dilworth, Erin

8. FOSTERING A SENSE OF PLACE AT WALTER STROM MIDDLE SCHOOL: EIGHTH GRADE SOCIAL SCIENCE RESEARCH PROJECTS
   Dilworth, Erin

9. BIOLOGY GOES BEYOND THE CLASSROOM AT ELLENSBURG HIGH SCHOOL
   Lannoye, Jennifer; Cottrell, Tom; Arlt, Tom; Carolan, Lana; Johnson, Jim

10. ELLENSBURG HIGH SCHOOL BIOLOGY FIELD TRIP TO UMTANUM CREEK
    Lannoye, Jennifer; Cottrell, Tom; Arlt, Tom; Carolan, Lana; Johnson, Jim

11. APPLIED WATERSHED SCIENCE AT KIWANIS POND, YAKIMA, WASHINGTON MIDDLE SCHOOL
    Eagleston, Holly; Lillquist, Karl; Quincy, Jackie

12. YAKIMA WATERSHED ACTIVITIES TO ENHANCE RESEARCH IN SCHOOLS: DAVIS HIGH SCHOOL PROJECT
    Lester, Jack; Irwin, Jason; Quincy, Robert; Lester, Michelle
13. OBSERVATIONS OF SNOW PACK AT SNOQUALMIE PASS: A YAKIMA WATERS PROJECT AT ELLENSBURG HIGH SCHOOL  
   Helland, Terry

14. MEASURING PRECIPITATION IN THE KITTITAS VALLEY: A YAKIMA WATERS PROJECT AT ELLENSBURG HIGH SCHOOL  
   Helland, Terry

CHEMISTRY

15. A QUANTITATIVE LITERACY APPROACH TO ENERGY OF LIGHT LAB ACTIVITIES  
   Helland, Terry; Gatlabayan, Shawn; Gutierrez, Clara

16. SYNTHESIS TOWARDS 3-MERCAPTO-2,4-DIPHENYL BUTANAMIDE AS A POTENTIAL INHIBITOR OF ANTHRAX LETHAL FACTOR  
   McCammant, Matthew; Priutz, Sarah; Fabry-Asztalos, Levente

17. HIGH SATURATED-FAT DIET AND DEFICIENT NICOTINAMIDE NUCLEOTIDE TRANSHYDROGENASE ARE CONTRIBUTING FACTORS TO MITOCHONDRIAL DYSFUNCTION IN C. ELEGANS  
   Bryner, Stephanie

18. TESTING THE EFFECTS OF ATRAZINE ON BEEF HEART MITOCHONDRIAL FUNCTION  
   Valera, Amanda

19. C₆₀ HAS OPPOSING DOSE-DEPENDENT EFFECTS ON ELECTRON TRANSPORT CHAIN FUNCTION AND OXIDATIVE STRESS IN ISOLATED BOVINE HEART MITOCHONDRIA  
   Rosario, Sara; Thomas, Carin

20. TRENDS IN PRECIPITATION CHEMISTRY AT MOUNT RAINIER OVER THE PAST 22 YEARS  
   Nieber, Annika; Rybka, Sara; Sorey, Mari

21. AMBIENT AEROSOL COLLECTION IN ELLENSBURG: EQUIPMENT SETUP ON CWU’S DEAN HALL  
   Casique, Hector; Mendoza, Cesar

22. IDENTIFICATION OF NEOCORTICAL PROTEINS THAT INTERACT WITH THE TRANSCRIPTION FACTOR SP8  
   Mullan, Michael

23. SYNTHESIS OF GLIONITRIN A: A POTENTIAL ANTIBIOTIC AND ANTICANCER COMPOUND  
   Conn, Stephanie; Wexler, Alex

24. SYNTHESIS OF CLAVATADINE A  
   Vreeland, Shannon

25. SYNTHESIS OF EU²⁺ DOPED SR₉B₂O₉ AND SR₇B₂O₉  
   Orme, Patrick

26. CHEMICAL FLUORESCENCE  
   Frank, Michael; Gutierrez, Clara
27. EXPANDING STUDENT LEARNING OPPORTUNITIES IN SCIENCE AND TECHNOLOGY: SCIENCE TALENT EXPANSION PROGRAM
   Johnston, Kathryn

BIOLOGY

28. USING INQUIRY TEACHING TO PROMOTE CRITICAL THINKING AND CONTENT KNOWLEDGE IN UNDERGRADUATE FUNDAMENTAL BIOLOGY
   Gao, Miao

29. CHICKEN NEURO EMBRYOLOGY: EFFECT OF CALCINEURIN ON AXON GROWTH
   Dickerson, Andre; Godinez, Maria; Selski, Dan

30. THE EFFECT OF CaN ON AXON GROWTH IN THE CHICKEN EMBRYO
   Schultz, Kaytlyn; Davis, Jesse; Godinez, Maria; Selski, Dan

31. IDENTIFICATION OF THE NEURAL CIRCUITRY FOR ADAPTATION OF EGG-LAYING BEHAVIOR IN THE ROUNDWORM, C. ELEGANS, USING EGG-LAYING DEFECTIVE MUTANTS
   Groves, Jennifer

32. THE EFFECT OF A HIGH-FAT DIET ON THE NEUROMUSCULAR PHYSIOLOGY USING THE ROUNDWORM, C. ELEGANS
   Willauer, Patrick

33. LONG-TERM EFFECTS OF THE ANTIDEPRESSANT, BUPROPION (WELLBUTRIN), ON THE ROUNDWORM, C. ELEGANS', BEHAVIOR.
   Bell, John

34. USING A WORM MODEL FOR ALZHEIMER’S DISEASE TO EXAMINE THE EFFECTS OF DIFFERENT FATTY ACID DIETS ON DISEASE DEVELOPMENT
   Kimuhu, Kinyanjui

35. NITRIC OXIDE MEDIATES HOOKWORM INFECTION IN HAMSTERS
   Berndt, Amanda; Moesch, Stephanie; McNutt, Sarah

36. EXPRESSION OF SOLUBLE PFR-5 IN ESCHERICHIA COLI
   Nation, Catherine

37. DETECTION AND QUANTIFICATION OF WINE SPOILAGE MICROORGANISMS
   Barnes, Steve; Antolock, Ryan

38. WINE FAULT ECOLOGY: SOURCES OF LACTIC ACID BACTERIA THAT CAUSE SPOILAGE
   Larson, Kyle

39. ISOLATION AND CLASSIFICATION OF BACTERIAL VIRUSES PRESENT IN SOAP LAKE
   Rambo, Amanda; Nitz, Kenie; Webb, Hannah

40. MAXIMIZING STARCH FOR HYDROGEN PRODUCTION IN CHLAMYDOMONAS REINHARDTII
   Brooks, Jenna; Perry, Jessica; Young, Ryan; Sotelo, Emily

41. DROUGHT-INDUCED FREEZE TOLERANCE IN RADISH (RAPHANUS SATIVUS) SEEDLINGS
   Sotelo, Emily

42. USING WHOLE PLASTID GENOMES FOR PHYLOGENY: ‘NEXT GENERATION’ SEQUENCING AND RELATIONSHIPS OF EPHEDRA AND GNETUM
   Aguilera, Justina; Walker, Ariel
43. FEMALE MATE CHOICE AND MEASURING MALE ATTRACTIVENESS IN THE FIELD CRICKET, *GRYLLUS FIRMUS*
   Curry, Megan; Buxel-Florenzen, Stefanie

44. EVALUATING SOILS IN THE TROPICAL DRY FOREST OF CHAMELA, MEXICO
   Adams-Lett, Lexton; Reed, Carly; Wilson, Roger

45. EXPLORING PATTERNS OF LIZARD DIVERSITY IN A TROPICAL DRY FOREST IN JALISCO, MEXICO
   Donoso, Marina, Leeds, Austin

46. CRITTERS IN LITTER: COMPARING TRAITS OF LEAF LITTER IN UPLAND AND ARROYO HABITATS OF A TROPICAL DRY FOREST IN JALISCO, MEXICO
   Barreca, April; Link, Denise, Bickford, Roger

47. IMPACT OF LARGE WOODY DEBRIS ON NITRIFICATION IN TANEUM CREEK, ELLENSBURG, WA
   Duke, Paul

48. AN ASSESSMENT OF STREAM HABITAT AND FISH PASSAGE ACROSS INTERSTATE 90 AT SNOQUALMIE PASS, WA
   Lamperth, James; James, Paul

49. SOIL AND GROUNDWATER NUTRIENTS ARE IMPORTANT TO COTTONWOOD GROWTH RATES IN RIVER FLOODPLAINS
   Westmark, Danielle

ENVIRONMENTAL STUDIES

50. EXAMINATION OF SALMON RESTORATION AND INSTREAM FLOW IN THE MANASTASH
   Louderback, Samantha; Emery, Jillian

SOCIOLOGY

51. DRIVING AND AGGRESSION AMONG COLLEGE STUDENTS
   Entz, Jessica
ANTHROPOLOGY AND MUSEUM STUDIES

52. SITE 45KT301: A REVIEW OF INVESTIGATIONS, ANALYSIS OF PROJECTILE POINTS AND EXPLORATION OF THE SITE’S RESEARCH POTENTIAL
   Shea, Holly

53. GEOARCHAEOLOGY OF THE EARLY HOLOCENE KITTITAS VALLEY: THE SANDERS SITE
   Ainsley, Margaret

54. ANALYSIS OF TERRESTRIAL SNAIL SHELL CONCENTRATIONS AT HOUSE SITE 2, TRYON CREEK, HELL’S CANYON, OREGON
   Braun, Joshua

55. THE NUNAMIUT IN THE BROOKS RANGE: AN ANALYSIS OF A FAUNAL ASSEMBLAGE FROM ANIGANIGARUK, ALASKA
   Keeney, Joe

56. AN EVOLUTIONARY HISTORY OF THE TIPI THROUGH HISTORICAL PHOTOGRAPHS
   Ratcliffe, Joel

57. CONNECTING THE SWAHILI PEOPLE TO THEIR PAST
   Palmaer, Erika

58. SETTLEMENT AND FISHING PATTERNS: GIS MODEL OF AN ARCHAEOLOGICAL LANDSCAPE
   Barrett, Carrie

59. TEACHING ARCHAEOLOGY WITH GIS: A STUDENT’S PERSPECTIVE
   Vargas, Estanislado

60. HELL’S CANYON SETTLEMENT PATTERNS: GIS MODELS OF ARCHAEOLOGICAL LANDSCAPES
   Hocking, Sara

CHIMPANZEE AND HUMAN COMMUNICATION INSTITUTE

61. A DESCRIPTIVE ANALYSIS OF CHIMPANZEES’ SIGNED CONVERSATIONS
   Wallin, Jason
POSTER PRESENTATION SCHEDULE

Only authors are listed for each paper/poster.
Mentors are shown in the ABSTRACT portion of this program.

AFTERNOON POSTER PRESENTATIONS, SESSION 41
BALLROOM

Posters on display from noon -3:30 p.m.
Presenters must be by posters during judging from 1:50 p.m. - 3:30 p.m.

THEATRE ARTS

1. THE TEMPEST: COSTUME DESIGN BY BRIAN JOHNSON
   Johnson, Brian
2. THE TEMPEST: A COSTUME DESIGN
   Ammons, Sarah
3. COSTUME DESIGN FOR SHAKESPEARE’S THE TEMPEST
   Holmes, Amy
4. THE LIVING MASK: SIMULATING SOUTH AFRICAN SCARIFICATION WITH MAKEUP
   Hodge, Ashlen
5. MAMA TOMCAT’S FLYING SCHOOL BY SPRING HERMANN: A COSTUME DESIGN BY LAURA M. REINSTATLER
   Reinstatler, Laura

MATHEMATICS

6. TO CORK OR NOT TO CORK?
   Flowers, Traca; Milne, Jason; Castro, Raul
7. STATISTICAL ANALYSIS OF NBA DATA
   Lu, Keijie; Wu, Jing; Li, Hui
8. SUPPLEMENTAL INSTRUCTION FOR FINITE MATHEMATICS: DO SUPPLEMENTAL INSTRUCTION SESSIONS INFLUENCE STUDENT’S GRADES OR ATTITUDE?
   Mendoza, Adriana
9. INCREASING MATHEMATICAL THINKING IN GENERAL EDUCATION MATHEMATICS COURSE: WOULD COMPUTER SIMULATION LABS HELP?
   Mendoza, Adriana

ENGLISH

10. A BETTER CHANCE FOR LEARNING
    Spalti, Erica
SOCIOLOGY

11. RETENTION OF FIRST YEAR STUDENTS OF COLOR IN HIGHER EDUCATION
   Williams, Emily

12. CRIME PER CAPITA: WASHINGTON STATE COUNTIES INVESTIGATED
   Goring, Kathleen

LAW AND JUSTICE

13. ECONOMIC INSECURITY, COLLECTIVE EFFICACY AND FEAR OF CRIME
   Johnson, Michelle; Britto, Sarah

ECONOMICS

14. FORECASTIT: ANALYSIS ACCELERATED – MOBILE ANALYSIS APPLICATIONS AND ON-DEMAND
    CONSULTING
   Voronov, Eliyahu

POLITICAL SCIENCE

15. INOCULATION MIGHT ONLY BE PART OF A WELL LAID POLICY AGAINST A POSSIBLE SWINE
    INFLUENZA PANDEMIC
   Hamblet, Michael

16. DEPENDENCY AND UNDERDEVELOPMENT: IMPERIALISM IN CONTEMPORARY LATIN AMERICA
    Aardal, Cole

17. INTERNET ACCESS FOR STUDENTS ON CAMPUS AT CENTRAL WASHINGTON UNIVERSITY:
    CAPACITY AND POLICY
    Merz, Michael

18. ANALYSIS OF DRAFT ORDINANCE RESIDENTIAL WIND ENERGY FOR ELLENSBURG
    Ghazanfarpour, Haleh
RESOURCE MANAGEMENT

19. ASSESSMENT, ANALYSIS, AND SPATIAL CONNECTIONS: A CONFLICT SOLUTION MODEL FOR EFFECTIVE DECISION-MAKING IN NATURAL RESOURCE MANAGEMENT
   Davidson, Charity

20. IMPACTS OF SOCIAL, HUMAN, AND CULTURAL CAPITAL ON COMMUNITY RESILIENCY OVER TIME
   Macguire, Connor

21. TOWARD SUSTAINABLE WATER RESOURCE MANAGEMENT IN GHANA: A CASE STUDY FROM THE BIRIM RIVER BASIN
   Adjepong, Godfried

22. AN ECOLOGICAL AND FUNCTIONAL ASSESSMENT OF DEPRESSIONAL WETLANDS IN THE QUINCY WILDLIFE MANAGEMENT AREA, GRANT COUNTY, WASHINGTON
   Gray, Jeffrey

23. SHORELINE IMPACTS DUE TO POTENTIAL INCREASES TO FULL POOL LEVELS, BANKS LAKE, WASHINGTON
   Wachholder, Tommy; Cordner, David; Gabriel, Anthony

24. MAPPING THE ALPINE TREE LINE ECOTONE CHANGES ON GOODE MOUNTAIN IN THE NORTH CASCADES NATIONAL PARK, WA FROM 1958 TO 2009
   Brookman, Tessa

25. ADDING A SPATIAL PERSPECTIVE TO COLLABORATIVE CONFLICT MANAGEMENT: A CASE STUDY FOR ELK MANAGEMENT PRACTICES IN THE UPPER SNOQUALMIE VALLEY, WASHINGTON
   Winter, Kristen

26. MASS WASTING INVENTORY OF THE YAKIMA RIVER CANYON
   Winter, Tom

27. LAND USE VARIATION ON MID-COLUMBIA PLATEAU UPLAND AND LOWLAND ARCHAEOLOGY SITES
   Anderson, CJ

GEOLOGICAL SCIENCES

28. DETECTION OF SNOW AVALANCHEs USING SEISMIC TECHNIQUES AND METEOROLOGICAL DATA, ROCK FACE SITE, SNOQUALMIE PASS, WASHINGTON
   Hogan, Eliya; Woods, Brad

29. USING IN SITU PLAGIOCLASE DATA TO DOCUMENT THE MAGMA PLUMBING DYNAMICS OF 1669 ERUPTION OF MT. EtnA, SikLY
   Hess, Alex; Moses, Maureen

30. THE COMPOSITIONAL VARIABILITY OF THE GRANITE HARBOUR INTRUSIVE SUITE PLUTON IN THE TRANSANTARCTIC MOUNTAINS
   Masen, Tiffany

31. MONITORING AWAKENING VOLCANOES USING LAPTOP COMPUTERS
   Wilson, Richard

32. GEOLOGIC MAPPING AND GEOCHRONOLOGY TO QUANTIFY FAULT SLIP WITHIN THE ADOBE HILLS, CA
   Nagorsen, Sarah

33. TRACKING DIETARY VARIATIONS THROUGH $^{13}$C AND $^{15}$N ISOTOPE ANALYSIS OF HUMAN HAIR
   Rinke, James; Stedham, Elizabeth; Rotman, Holly
NUTRITION, EXERCISE, & HEALTH SCIENCES

34. PSYLLIUM MIXTURE IS AN ACCEPTABLE GLUTEN-FREE SUBSTITUTE FOR ALL-PURPOSE FLOUR IN BANANA BREAD
   Cummins, Mary; Benedicto, Magieline; Schlosser, Sarah

35. BLACK BEAN POWDER AS A NUTRITIONAL ADDITIVE TO A COMMERCIAL GLUTEN FREE BROWNIE MIX
   Richardson, Kimberly; Shields, Margaret; Kangiser, Darrell

36. EFFECTS OF FUNCTIONAL FIBER ON POSTPRANDIAL GLUCOSE IN HEALTHY INDIVIDUALS MEASURED BY A CONTINUOUS GLUCOSE MONITORING SYSTEM
   Dow, Shireen; Herrington, Stefanie; Pritchett, Kelly; Gee, David

37. ACACIA GUM AS A FAT SUBSTITUTE PRODUCES AN ACCEPTABLE REDUCED-FAT BROWNIE
   Cohoe, Theresa; Engelson, Liv; Norkoski, Anna

38. DIET LEMON LIME SOFT DRINK AS A REPLACEMENT FOR EGGS, OIL, AND WATER IN A COMMERCIAL CAKE MIX MAY BE AN ACCEPTABLE REPLACEMENT
   Davis, Kimberly; Baker, Priska

39. REDUCED FAT AND FAT-FREE CREAM CHEESES ARE ACCEPTABLE SUBSTITUTIONS FOR BUTTER IN LEMON COOKIES
   Crosson, Chad; Hahn, Katie; Reynolds, Emily

40. THE FRESHMAN 15: IS CENTRAL WASHINGTON UNIVERSITY CONTRIBUTING TO AMERICA'S EVER GROWING WAISTLINE?
   Groffman, Rebecca; Harrison, Andrea

41. SUBURBAN MIDDLE AND HIGH SCHOOLS OFFER MORE SERVINGS OF FRESH FRUITS AND VEGETABLES THAN RURAL OR URBAN SCHOOLS
   Kangiser, Darrell; Cunnington, Melissa; Tibay, Joseph

42. CWU STUDENTS' ATTITUDES AND BEHAVIOR SURROUNDING SEXUAL HEALTH AND PREVENTIVE CARE
   Reed, Morgan; Cordero, Christina; McDaniel, Jessica; Messier, Danielle

43. RPE AND GLUCOSE RESPONSE DURING HIGH INTENSITY INTERMITTENT CYCLING WITH AND WITHOUT A PRE-EXERCISE FEEDING
   Carriker, Colin; Pritchett, Kelly; Pritchett, Robert

44. LACTATE THRESHOLD COMPARISON AMONG ANAEROBIC ATHLETES
   Kuykendall, Brandon; Mullen, Bo

45. THE EFFECT OF PARTICIPATING IN AESTHETIC SPORTS ON MENSTRUAL HEALTH, EATING DISORDER RISK, CALORIC INTAKE, AND SELF ESTEEM
   Douglass, Felicia; Layton, Amanda; Owens, Tristen
PSYCHOLOGY

46. INVISIBLE GENDER IDENTITY: HOW TO COUNSEL PEOPLE LIVING IN TWO GENDER WORLDS  
   Albers, Ashley; Morgan, Sam Hawk

47. USING HATHA YOGA IN COUNSELING  
   Ingram, Christina; Brammer, Robin

48. INVESTIGATING THE RELATIONSHIP BETWEEN CLASS START TIME AND STUDENT EVALUATION RESPONSES  
   Bales, Laura

49. CHRONIC FLUOXETINE (©PROZAC) DOES NOT DIFFERENTIALLY ALTER BEHAVIOR BASED ON AGE IN BALB/CJ MICE.  
   Newsome, Eluid; Mann, Rusty; Gabriel, Kara

50. A COMPARISON OF TWO WEB-BASED, BRIEF ALCOHOL INTERVENTIONS FOR FIRST-YEAR STUDENTS  
   Farmer, Gail; Gabriel, Kara

51. HAMSTERS INFECTED WITH THE HOOKWORM, ANCYLOSTOMA CEYLANICUM SHOW PRE-ANEMIA CHANGES IN BEHAVIOR  
   Parker, Joshua; Ring, Ian

52. MOBILE PHONE TECHNOLOGY AND ITS EFFECT ON AFFECT: IS TECHNOLOGICAL DEPENDENCE THAT SERIOUS?  
   Parker, Joshua

53. MEANINGFUL CONNECTIONS: USING INTERGENERATIONAL SERVICE-LEARNING TO PROMOTE POSITIVE PERCEPTIONS ABOUT OLDER ADULTS  
   Spencer, Adrian; Ingram, Christina

54. THE APPLICATION OF AIMSWEB TESTING AND THE RESPONSE TO INTERVENTION TOOL  
   Little, Suzanne; Acosta, Elaine; Angell, Karen; Thompson, Jamie

55. INTERTEACHING: A COMPONENT ANALYSIS AND COMPARISON BETWEEN TRADITIONAL COLLEGE CLASSROOM INSTRUCTION  
   Miller, Katie; Assouline, Jonathan; Zayac, Ryan; Paulk, Amber

56. INTERGENERATIONAL READING PROGRAMS AND OLDER ADULT QUALITY OF LIFE  
   Linsley, Michelle

57. PERCEPTIONS OF COERCION  
   Dodgen, Lisa

58. NONCONSENSUAL SEXUAL BEHAVIOR: THE ROLE OF WORDING AND SCALE RANGE ON PERCEPTIONS AMONG COLLEGE STUDENTS  
   Chavez-Gonzalez, Diocelina
FASHION DESIGN EXHIBITION

59. PIECES
   Bakeman, Mary

60. SWEET LORRAINE
   Cahill, Lorraine

61. LOVELY LUCILLE: VINTAGE VISIONS
   Dillion, Jamie

62. BLACK ALLEY
   Flenniken, Arielle

63. POUVOIR ROMANTIQUE
   Frauen, Shiloh

64. POPRETRO
   Eklund, Andrea

65. ELYSIA SWEETHEART DRESS
   Peterschmidt, Bernadette

66. SEA QUEEN
   Rasmussen, Kortney

67. INSTINCT BY DAVID MICHAEL
   Reimer, David

68. ANGELINA RICH
   Rich, Angelina

69. ALL TIED UP
   Shipler, Jessie
CREATIVE ACTIVITY SCHEDULE

Only presenters are listed for each creative activity.
A more complete description of each work is provided in the ABSTRACT portion of this program.

SESSION 14: FILM AND VIDEO STUDIES
ROOM: SURC THEATRE

9:30  BREAKING & ENTERING
      Gunderson, Austin

9:50  DREAM FRONT
      Huerta, Leonard Allen

10:10 THE MOTION PICTURE CLUB
      O’Banion, Sean

10:30 A CHARCOAL HEART
      Iiyama, Brian

SESSION 22: MUSIC
ROOM: SURC THEATRE

12:00 NATIONAL TRUMPET COMPETITION – ENSEMBLE DIVISION
      Pickard, Stephen; Henderson-Wans, Christi; Martinson, Sarah; Hinckley, David; Stein, Jon; Fredrickson, Chris

12:20 PERFORMANCE OF CONCERTO FOR TRUMPET AND ORCHESTRA (CHARLES CHAYNES)
      Anderson, Paige

12:40 PERFORMANCE OF MARCEL BITSCH AT THE NATIONAL TRUMPET COMPETITION
      Hurd, Tristan

SESSION 23: FASHION SHOW
ROOM: FRONT OF WILDCAT SHOP

12:00 FASHION ODDITY
      Designs by: Bakeman, Mary; Cahill, Lorraine; Dillion, Jamie; Flenniken, Arielle; Frauen, Shiloh; Peterschmidt, Bernadette; Rasmussen, Kortney; Reimer, David; Rich, Angelina; Shipler, Jessie
      Student Design Coordinator: Stephanie Sype

SESSION 31: DANCE
ROOM: SURC THEATRE

1:50  BLUSTER
      House, Alicia

2:10  TOXIC
      Kelloniemi, Ashley

2:30  THE CONSEQUENCES OF NORTH AND SOUTH
      Rice, Rylee
SESSION 39: THEATRE ARTS
ROOM: SURC THEATRE

3:40  CENTRAL THEATRE: AFTER SCHOOL
      Curtis, Zac; Curtis, Mindy

4:00  WOMEN'S SUFFRAGE – A READERS' THEATRE
      Walker, Sharryn; Byman, Katelyn; Bradford, Keeley; Wood, Jessica; Mannin, Jennifer; Hiatt, Cynthia

4:20  DOG SEES GOD: IDENTITY THEMES
      Stahl, Kathryn

4:40  WOLF AT THE DOOR
      Shanks, Andrew

BIG BRASS BLOWOUT
MUSIC BUILDING
7 p.m. (See map on page 12 for directions)

7TH ANNUAL JURIED ART SHOW
SARAH SPURGEON GALLERY
8:00 a.m. -5:00 p.m.
(See map on page 12 for directions)
ABSTRACTS

Arranged by Last Name of First Author

DEPENDENCY AND UNDERDEVELOPMENT: IMPERIALISM IN CONTEMPORARY LATIN AMERICA
Aardal, Cole
Faculty Mentor(s): Gilberto Garcia, Political Science

41 (Afternoon Poster Session in Ballroom)

Atilio Boron’s Empire and Imperialism: A Critical Reading of Michael Hardt and Antonio Negri challenges the notion that imperialism is dead and that what we have today is an Empire. Moreover, Boron states that the concepts of dependency, underdevelopment and imperialism are missing in most contemporary studies of Latin American economic and political development. The objective of this paper is to place the discussion of this problem in the context of contemporary Latin American development. This paper examines the continuation of dependency in Latin America and its effect on underdevelopment. It further examines the ways in which the countries of Latin America are attempting to deal with First World imperialism rather than this notion of an Empire.

THE DEVELOPMENT OF A COMPUTER MODEL OF SHELL RESONANCES AS A TOOL FOR NONINVASIVELY MONITORING INTRACRANIAL PRESSURE CHANGES
Abdul-Wahid, Sami
Faculty Mentor(s): Andy Piacsek, Physics

2 (Oral Session 8:00-9:20 in 137A)

A possible method of measuring the pressure inside the human skull (intracranial pressure, or ICP) from its acoustical properties is investigated. The goal is to predict shifts in skull resonance frequencies due to increased ICP. In the present initial phase, the resonance frequencies of empty cylindrical and spherical shells were calculated with a finite-element modeling package (COMSOL). Details of how the computer model is set up and what its accuracy depends on will be presented. Future work, as part of a Science Honors project, will incorporate biologically accurate representations of the human cranium, cerebrospinal fluid, and cerebral tissue. Monitoring ICP is essential when there is a high risk of dangerously high ICP levels, such as may occur with head trauma. The computer model being developed may lead to a less invasive method for measuring ICP than the current accepted practice of drilling a hole in the patient’s skull and inserting a probe.

EVALUATING SOILS IN THE TROPICAL DRY FOREST OF CHAMELA, MEXICO
Adams-Lett, Lexton; Reed, Carly; Wilson, Roger
Faculty Mentor(s): Lisa Ely, Geological Sciences; Dan Beck, Biological Sciences

40 (Morning Poster Session in Ballroom)

One of the world’s largest intact tropical dry forests stretches along the western coast of Mexico. Our studies took place within the Chamela-Cuixmala Biosphere Reserve which averages seventy five centimeters of rainfall annually with nearly 80% falling between July and October. Through our research, we sought to determine whether there was a relationship between various soil properties, such as grain size, soil moisture, and pH levels and whether the soils differed between locations. Soil was sampled at two depths, surface and 20 cm, at ten sites along two established hill slope transects. The samples were then analyzed to determine grain size, pH, and soil moisture. Our initial hypotheses were that grain size would decrease as we moved down slope and soil moisture would be greater in areas protected by leaf litter. Contrary to our hypothesis we found that sediment size increased on the Calandria transect as we moved down slope however we found no correlation on the Buho transect. The Calandria transect typically had a larger percentage of gravel while the Buho transect had a much higher volume of silt/clay. Soil pH levels were generally more acidic on the Calandria transect than on the Buho transect. As expected, soil moisture was generally greater with depth on both transects. Overall Calandria had lower moisture content than Buho which correlates with a greater percentage of gravel. Ideas for further research include establishing a consistent site distribution between arroyos and uplands, sampling at greater depths, and comparing soil properties to bedrock lithology.
TOWARD SUSTAINABLE WATER RESOURCE MANAGEMENT IN GHANA: A CASE STUDY FROM THE BIRIM RIVER BASIN  
Adjepong, Godfried  
Faculty Mentor(s): Kathleen Barlow, Resource Management

41 (Afternoon Poster Session in Ballroom)

As water resources increasingly become scarce around the world, there is growing concern about the need for sustainable water resources management, particularly, as water has no substitute. This need is echoed in the United Nation’s Millennium Development Goals because good water management is critical to a healthy environment and sustainable development. Focusing in the Birim River Basin, Ghana, this research seeks to: i) identify and examine water problems, ii) critically examine Ghana Water Policy and identify its challenges in meeting set goals, iii) identify and examine traditional institutions, belief systems and social practices that have relevance to Integrated Water Resource Management, and iv) make suggestions for policy revisions that include use of Traditional Ecological Knowledge to address local water resource problems. The study employs in-depth semi structured interviews, focus group discussions and photography to gather data. Successful local and international models provide a theoretical framework and basis for analysis.

TOWARD SUSTAINABLE WATER RESOURCE MANAGEMENT IN GHANA: A CASE STUDY FROM THE BIRIM RIVER BASIN  
Adjepong, Godfried  
Faculty Mentor(s): Kathleen Barlow, Resource Management

15 (Oral Session 12:00-1:40 in 135)

As water resources increasingly become scarce around the world, there is growing concern about the need for sustainable water resources management, particularly, as water has no substitute. This need is echoed in the United Nation’s Millennium Development Goals because good water management is critical to a healthy environment and sustainable development. Focusing in the Birim River Basin, Ghana, this research seeks to: i) identify and examine water problems, ii) critically examine Ghana Water Policy and identify its challenges in meeting set goals, iii) identify and examine traditional institutions, belief systems and social practices that have relevance to Integrated Water Resource Management, and iv) make suggestions for policy revisions that include use of Traditional Ecological Knowledge to address local water resource problems. The study employs in-depth semi structured interviews, focus group discussions and photography to gather data. Successful local and international models provide a theoretical framework and basis for analysis.

USING WHOLE PLASTID GENOMES FOR PHYLOGENY: ‘NEXT GENERATION’ SEQUENCING AND RELATIONSHIPS OF EPHEDRA AND GNETUM  
Aguilera, Justina; Walker, Ariel  
Faculty Mentor(s): Linda Raubeson, Biological Sciences

40 (Morning Poster Session in Ballroom)

_Ephedra_ is an intriguing clade of plants that have been used medically for thousands of year. This ancient and diverse group attributes its survival over this long period of time to the stubbornness of its genes. However, these genes could potentially unlock how evolution occurs and produce a better understanding about the origin of species. Approximately 30 species of _Ephedra_ are living today in open environments dispersed around the world. The evolutionary relationships of these species are poorly understood and have been difficult to resolve using a small number of genes. We are extracting more genetically variable data, that is essential to determine relationships, using a new strategy that will allow us to acquire a nearly complete chloroplast genome for each species. To generate data, first we amplify the chloroplast genome in 25-30 pieces, depending on the size of the genome. Then we combine the PCR (Polymerase Chain Reaction) products and compile libraries that is then sequenced using the Solexa method. From there we will be able to analyze the data and assemble the genome. This will comprise data that will produce superior phylogenic trees compared to previous methods. After sequencing more than 20 _Ephedra_ species using the Solexa approach, we are able to modify our Solexa approach to create a strategy to allow amplification of the plastid genomes of _Gnetum_ species. Our data represents a large increase in the amount of DNA data available to address the problematic issues remaining in understanding _Ephedra_ and _Gnetum_ relationships.
GEOARCHAEOLOGY OF THE EARLY HOLOCENE KITTITAS VALLEY: THE SANDERS SITE

Ainsley, Margaret
Faculty Mentor(s): Steven Hackenberger, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

The Sanders Site (45KT315) is located on Johnson Creek within the US Army Yakima Training Center (YTC). Dr. William Smith, Central Washington University, excavated trenches 1501, 1502 and 1504 on the site in the early 1970s. All three trenches yielded significant amounts of bone and lithic material, and the stratigraphy in each trench was well diagrammed. Radiocarbon dates on bone samples from the lowest levels of trench 1502 indicate the earliest site occupations began between 11,000 and 10,000 BP. The majority of site occupations and debris, including shell lenses, date to between 4000 and 3000 BP. These radiocarbon results are evaluated within a larger radiocarbon database for the YTC. Strata documented within 45KT315 are correlated with strata recorded across Johnson Creek at site 45KT976. I am also attempting to identify if one portion of Stratum 4/5, illustrated in the profile of trench 1504 represents a house feature, or gully. This strata and/or feature may date to as early as 4000 BP.

INVISIBLE GENDER IDENTITY: HOW TO COUNSEL PEOPLE LIVING IN TWO GENDER WORLDS

Albers, Ashley; Morgan, Sam Hawk
Faculty Mentor(s): Robyn Brammer, Psychology

41 (Afternoon Poster Session in Ballroom)

This presentation delves into practical ways to work with transgendered clients. There is emerging agreement on the cause of transsexualism (genetic/hormonal) and the likely transition age (middle age), but there is little understanding of what happens between these times or how transgendered people view themselves through this development. This international, online study (N=174) demonstrates the existence of “invisible transsexualism” (i.e., people who alter their body with hormones or surgery but live in their birth gender role). A new theory is provided (Transgender Development Continuum) addressing how gender identity progresses through cyclical stages. These stages are fluid, often melding with earlier or later stages. The Birth Assigned Role, Pushing Boundaries, Invisibility, Exploration, Deepening Commitment, and Internal Synthesis/Trans. stages are discussed in more detail in the poster.

CHARACTERIZATION OF GEL-TYPE ZINC SULFIDE QUANTUM DOT SENSITIZED SOLAR CELLS

Alman, Adam
Faculty Mentor(s): Dion Rivera, Chemistry

29 (Oral Session 1:50-3:30 in 202)

Three different types of fully integrated ZnS quantum dot-TiO$_2$ nanoparticle-suspension agent gels were used to create films for usage in photovoltaic cells. The films were annealed onto a TEC-8 F:SnO$_2$ conductive glass electrode and the cell was completed by adding a polyl-solvated I$^-$/I$_3^+$ redox couple to the film and capping the cell with a counterelectrode constructed of graphite-coated TEC-8 glass. Electrical output of the cells under a 360 W halogen light source and a natural or simulated (1000 W xenon arc lamp) sunlight source were estimated by multi-meter. The highest absolute energy conversion efficiency seen was using an acidified quantum dot film under natural/simulated sunlight (0.2050% ± 27% RSD). Statistical analysis showed that the two film types using polymers were unsuccessful in producing viable photovoltaic processes, while the acidified quantum dot films without polymers showed significant output versus water cells under sunlight. Spectrophotometric analysis showed an inverse relationship between cell functionality and cell film fluorescence.
EFFECTS OF KURDISH STRESS PATTERNS ON ORAL PRODUCTION OF KURDISH LEARNERS OF ENGLISH
Almas, Khasrow
Faculty Mentor(s): Charles Li, English

18 (Oral Session 12:00-1:40 in 140)

Kurdish language, due to multiple reasons, has not been widely researched prosodically. As a result, both Kurdish linguists and linguists of other languages have not had a definitive answer to whether the language is syllable-timed or stressed-timed. In this research project, I hypothesized that the first syllable of Kurdish polysyllabic words is nearly always stressed and that this feature of word-initial stress could transfer to the phonological acquisition by Kurdish learners of English as a foreign language. Four native Kurdish speakers, two males and two females, who were all high-intermediate or advanced learners of English at the Millennium Institute in Iraqi Kurdistan at the time of my data collection, served as participants in this research project. Using Skype, I recorded stretches of their conversations with me online and their online readings of a list of sentences. Results show that transfer does occur but that the transfer is also correlated with other factors, including age, the length of classroom instruction, and exposure to English movies and T.V. shows.

THE TEMPEST: A COSTUME DESIGN
Ammons, Sarah
Faculty Mentor(s): Scott Robinson, Theatre Arts

41 (Afternoon Poster Session in Ballroom)

A costume design for The Tempest by William Shakespeare set on an island off the coast of India during the Italian renaissance.

PERFORMANCE OF CONCERTO FOR TRUMPET AND ORCHESTRA (CHARLES CHAYNES)
Anderson, Paige
Faculty Mentor(s): John Harbaugh, Music

22 (Performance 12:00-1:40 in SURC Theatre)

On March 13, 2010, I performed Charles Chaynes’ Concerto for Trumpet and Orchestra at the National Trumpet Competition in Fairfax, Virginia. As a finalist at this competition, I competed against students from schools such as Juilliard and Indiana University. This trip gave me the opportunity to hear trumpet players from all over the country, network, and meet possible future mentors. I will be performing this piece due to its technical difficulties and playful character.

DEEP ECOLOGY IN SHALLOW WATERS: ENVIRONMENTAL PROBLEMS AND THEIR SOCIETAL EFFECTS IN NORTHWESTERN CHINA
Anderson, Tyler; Scalora, Alina; Schmidt, Alex
Faculty Mentor(s): Hong Xiao, Sociology

6 (Oral Session 8:00-9:20 in 202)

This is a presentation of exploratory research on the relationship between the environment and social issues in rural villages in northwestern China. The research was generated from surveys and interviews conducted in Qinghai’s Xunhua County and Gansu’s Huining County. While water scarcity is prevalent in western China, in the areas researched, it was found that the most determinant factor in water access was not the presence of water, but the availability of water transporting infrastructure. It was also found that agricultural productivity is not necessarily based on amount of land available, but is dependent on availability of water and labor. Villagers’ main source for environmental information was found to be mass media; there was a noticeable lack of access to technical information, and remote areas, with the most environmental problems, were most lacking in information. Labor export in the villages visited did not appear to be linked to environmental quality, but instead to the economic draw of large cities. Because of this growing trend of men migrating to urban areas, women’s roles in the Salar and Han villages visited were found to be dependent on the economic status of their households.
LAND USE VARIATION ON MID-COLUMBIA PLATEAU UPLAND AND LOWLAND ARCHAEOLOGY SITES

Anderson, CJ
Faculty Mentor(s): Patrick McCutcheon, Resource Management

41 (Afternoon Poster Session in Ballroom)

Upland and lowland archaeological records show extensive land use variability when the east Saddle Mountains are compared to the Wenas Creek-Yakima River confluence. Physiographic divergence may account for land use differentials observed between the two research areas. The extensive upland spatial scale (i.e., greater area \( [m^2] \)), which the lowland setting lacks, may distort differential patterns of artifact type frequencies and account for some of the dissimilarity in size and density of artifact clusters. Another explanation of land uses in the research areas is that pre-contact Plateau peoples conducted similar resource acquisition activities regardless of the macro- or microenvironmental setting in which preferred resources occurred. Land use models for the pre-A.D. 1855 prehistoric and post-A.D. 1855 historic periods offer a means of comparing the two environments based on surface survey data and physiographic and geoarchaeological information recorded during the 2008 field season in the east Saddle Mountains and the Wenas Creek-Yakima River confluence.

ZINC SULFIDE QUANTUM DOT PHOTO-ELECTRIC PROPERTIES

Andrew, David
Faculty Mentor(s): Dion Rivera, Chemistry

29 (Oral Session 1:50-3:30 in 202)

Zinc sulfide (ZnS) quantum dots are nano-sized particles that may be useful as a photo-electric material in solar cells. Other quantum dots have been explored in this area but are more toxic than the ZnS quantum dots or more difficult to produce so less feasible in an industrial setting. This research examines the ZnS quantum dot photo-electric properties by creating solar cells and testing their output. The cells were fabricated using; glass with an conductive layer, carbon smoke, Titanium dioxide (\( TiO_2 \)), acetic acid, ZnS quantum dots, and a iodide solution. The iodide solution replenished the electrons to the quantum dots. The cell output was tested under natural and artificial light, varying carbon layer thickness, and varying TiO\(_2\) layer thickness. ZnS quantum dots were applied to the cells using the drop method and as well as absorption into the TiO\(_2\) through soaking. Ethylene glycol was tested adding only a small amount to the some of the soaking cells. The effect of the varying conditions on the cell output will be discussed.

THE INTRODUCTION OF WOMEN TO COMMEDIA DELL’ARTE: A BUSINESS VENTURE?

Assaf, Sahar
Faculty Mentor(s): Nadine Pederson, Theatre Arts

9 (Oral Session 9:30-10:50 in 137B)

Commedia dell’arte, a style of Italian comedy that flourished between 1570 and 1650 and thrived until 1775 in Italy, France, and other European countries is a significant aspect of recent and contemporary theatre history scholarship. This historical significance stems from several reasons. Commedia dell’arte had a great influence on the later theatrical practices all over Europe. Later European playwrights, Moliere, Shakespeare and Lope de Vega to name some, developed its famous stock characters in their plays. Its improvisatory nature credited it for the most important advancement in acting in the Italian Renaissance. The repeated bits of its physical comic business are present in twentieth-century film and television comics. Additionally, commedia dell’arte, in what is considered its most important achievement, introduced women onto the stage. Women were performing in Europe before the commedia dell’arte created its famous inamorata, but commedia troupes are credited with introducing the professional actresses as star performers in Europe. Nevertheless, the actual status of women in commedia companies as well as why women were accepted into these companies is still debatable among historians and need more research and analysis. This paper considers the question of women in the Italian commedia dell’arte. By consulting primary sources, namely the Recueil Fossard and other illustrations published in Duchartre’s The Italian Comedy in 1966, and notable secondary scholarship on the topic, it attempts at conjecturing why women were employed by the commedia troupes in the first place? And what was their status in these troupes?
GENETIC DIVERSITY OF WATER MOLDS: WHAT’S INFECTING AMPHIBIAN EGGS?
Ault, Kori; Wagner, Steve; Johnson, Jim
Faculty Mentor(s): Steve Wagner, Biological Sciences

16 (Oral Session 12:00-1:40 in 137A)

Water molds, primarily in the genus *Saprolegnia*, have been implicated in widespread mortality of amphibian embryos. Although a number of water mold species infect amphibian embryos and larvae, the pathogens involved in die-offs or utilized in ecological studies often remain unidentified or identified as only one of four species. However, recent work indicates the diversity of water molds infecting amphibian embryos may be significantly higher than what was previously known. Unfortunately, traditional morphological methods of identification have proven ineffective, and isolation methods only recover the fastest growing taxa. To avoid these limitations, we extracted all DNA associated with Western Toad (*Bufo boreas*), Cascade Frog (*Rana cascadae*) and Pacific Treefrog (*Pseudacris regilla*) embryos from a single pond in central Washington. The gene ITS was amplified using primers for eukaryotic microorganisms, and used to construct a clone library. Phylogenetic methods were then used to assess the relationships between newly recovered sequences and previously studied taxa. The water molds recovered from amphibian embryos in this study ranged in sequence difference from 4-28%, and grouped into eleven distinct genetic groups. Interestingly, water molds present on embryos differed among species, and the assortment of water molds changed as egg masses aged. Based on these results, we strongly recommend that ecological studies of amphibian saprolegniasis take into account the diversity and potential interactions between these pathogenic water molds.

ALCOHOLIC DEPENDENCY: STATE AND CHURCH DOMINATION OF ALCOHOLIC BEVERAGES IN MUSCOVITE RUSSIA
Bailor, Karen
Faculty Mentor(s): Roxanne Easley, History

17 (Oral Session 12:00-1:40 in 137B)

The Muscovite Period in Russian history was a time of great political and social change. The state shifted toward autocracy, most often associated with Ivan IV, or Ivan the Terrible, assuming the throne in 1547. Additionally, this period bears witness to an increased role of the Eastern Orthodox Church in multiple aspects of Russian society. Alcohol usage during this period serves as a lens for analysis, clearly illustrating the rise of the historical trends of autocracy and orthodoxy through the limitations placed on its production, marketing, and consumption by the state and church predominately during the sixteenth century. Foreign accounts, such as those of Giles Fletcher and Heinrich von Staden, as well as state documents identify strong efforts by both institutions to control the profits as well as the moral degradation associated with alcohol usage, suggesting an early collaborative effort between the two institutions and warranting further analysis into the significance of food and beverage histories as multidisciplinary reflections of larger historical themes.

PIECES
Bakeman, Mary
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

My submission for SOURCE, Pieces, is an apparel garment that will be paired with a poster that describes my theme and inspiration. I was inspired by the sophisticated 1940s silhouettes and a fun floral fabric, and wanted to experiment with design elements to create a new look for spring fashions. My theme for the line is using classic silhouettes from the 1940s and displaying them in a new way. I use unique dart and seam placement to create interesting lines that splay outward from cut-outs that are focal points in all my garments. I hope that my submission to SOURCE will be intriguing as well as inviting. This is one in a line of three garments; the entire line can be seen at the Fashion Merchandising Fashion Show, *Fashion Oddity*, May 22 at 7 p.m. in the Milo Smith Theatre in McConnell Hall.
The global climate is constantly changing. In the past, due to changes in carbon dioxide and oxygen levels, the climate has naturally oscillated across millions of years, affecting the natural world but continuing to change to effectively create stable biomes. Since the technical and social changes of Industrial Revolution have progressed into modern society, people have added massive amounts of carbon dioxide to the atmosphere. This has caused the global climate to begin irreversible changes. Social science provides information regarding individual and group values and demonstrates that the use of greenhouse gas emitting factories and polluting products is based on the cultural value of material goods and the social disregard for environmental externalities. Physical science provides factual information regarding the natural effects of increased amounts of carbon dioxide in the atmosphere. Through literary research and review, the effect of cultural values, economic standards, and implementation of political processes it becomes clear that both the physical and social sciences need to be considered when studying and analyzing the causes and effects of global climate change.

INVESTIGATING THE RELATIONSHIP BETWEEN CLASS START TIME AND STUDENT EVALUATION RESPONSES

Because of the importance placed on Student Evaluation of Instruction (SEOI) questionnaires as indicators of teaching effectiveness, the current study was designed to examine the influence of class instruction time (i.e., when, during the day, the class started) on student satisfaction as indicated by student responses on SEOIs at Central Washington University. Specifically, SEOI Form A items 28 and 29, which ask students to evaluate the course as a whole and the instructor’s teaching effectiveness, respectively, were used as indicators of student satisfaction from 2004-2009; a dataset that included ~246, 400 SEOI forms. Instruction start time was grouped into sequential two-hour blocks throughout the day so that each student response was coded according to quarter, year, time block, course level, and CWU College (i.e., College of Arts and Humanities, College of the Sciences, College of Business, and College of Education & Professional Studies). Preliminary analyses of 2008 and 2009 data show response patterns that are influenced by interactions among all the assessed variables. For example, time-block interacted with College, with both the College of Business and College of the Sciences showing a general trend of significantly increased satisfaction as the day progresses. The responses from the College of Arts and Humanities and the College of Education showed more stability throughout the day, with the College of Education rating items 28 and 29 significantly higher overall than the other colleges. Further analyses will be utilized to determine if such effects are observed over all the years in the study.

A DISCUSSION OF THE MENTAL HEALTH OF PUBLIC SCHOOL TEACHERS

In 12 years of public education, the chances are 7 to 1 that a student will have at least 2 maladjusted teachers with minor psychiatric disorders (MPD). This presentation explores the results of a research study (survey) of teachers and civil servants in a major metropolitan area in Washington State. The presentation explores the likelihood of having minor psychiatric disorders (MPD) among teachers with that among civil servants, and to investigate what factors are specifically associated with MPD in teachers. This presentation also explores ways to improve teachers’ mental health, including (1) control of teacher candidates, (2) broader training for better teacher understanding of human nature and its problems, (3) assisting teachers by means of in-service training programs, (4) administrative support of teachers, and (5) praise for successful teaching. This information is particularly useful to teacher education faculty and students in preparing for the teacher workforce.
This presentation will begin with a short examination of the history of Native Americans in the US and specifically in Washington State, including a brief overview of several of the larger tribes. Next, we’ll delve into the theories surrounding Indigenous Education. We’ll look at what a number of studies have to say, and the implications of their results. Then, we’ll examine a number of case studies in other areas where Indigenous Education has been successful, including the Navajo tribe and the Maori in New Zealand. Lastly, I’ll extrapolate methods and theories from the studies and case studies about successfully incorporating indigenous cultures into the classroom curriculum in a manner which benefits both indigenous and non-indigenous students, and end with a few activities wherein participants can experience some of my methods so as to better understand them.

Our research project explores differences in retail technology and consumer behaviors between Japan and the USA. Our focus is on influences of vending machine technology and vending machine sales promotions in various retail industries in regards to consumer behavior. Therefore, we are taking into account the design, function, product display and the various types of vending machines as well as external factors characterizing consumer behaviors to vending machines. Our first hypothesis is that regional differences, such as population density and environment, lead to certain consumer behaviors and attitudes towards vending machines. We are also considering differences in cultures of each country and how it affects consumer behavior. Our second hypothesis is that consumer behaviors are influenced by vending machine advancements and the levels of tolerance and adaptation towards new technology of vending machines. Our last hypothesis is that the Japanese way of sales promotion through vending machines will not work for US consumers. Our basic methods are descriptive data analysis as well as the use of statistical methods because we are using a comparative study approach. We are collecting data such as the populations of both USA and Japan, the specific population density of those areas, the cost of renting a location compared to renting or owning a vending machine. We are also finding information about the product life cycle of vending machines, numbers of vending machines made, and number of vending machine manufacturers. Finally, we collected information and cases of successful marketing strategies and sales promotions by vending machines.

Bacterial wine spoilage is caused by species of bacteria belonging to groups termed Lactic Acid Bacteria (LAB) and Acetic Acid Bacteria (AAB). Because the compounds produced by these bacteria can decrease wine quality, it is important to know which organisms are present in wine during all phases of its production. One way to detect microorganisms is to detect specific genes unique to a species. Quantitative PCR (QPCR) not only detects these genes but can determine the number of organisms present. A main drawback is its ability to detect DNA from dead organisms. The objective of this research is to determine whether this is a minor issue, or if the method significantly overestimates viable bacterial numbers in wine. The goal of this project is to culture spoilage microorganisms in different wines to better understand their viability and detection characteristics. Red and white wines were inoculated with known amounts of each bacterium and incubated for twenty-four hours. Samples were taken from inoculated wine to determine the number of viable bacterial cells present. To date, all species tested have shown reduction in viability after twenty-four hours growth in wine. This may be due to the wine’s low pH and the little nutrients it has to offer in comparison to the growth media currently being used to culture the organisms. Once consistent numbers of viable bacteria are recovered from wine, they will be subject to QPCR, and comparisons of bacterial populations will be made between viable counts and the QPCR data.
CRITTERS IN LITTER: COMPARING TRAITS OF LEAF LITTER IN UPLAND AND ARROYO HABITATS OF A TROPICAL DRY FOREST IN JALISCO, MEXICO
Barreca, April; Link, Denise; Bickford, Roger
Faculty Mentor(s): Daniel Beck, Biological Sciences; Lisa Ely, Geological Sciences

40 (Morning Poster Session in Ballroom)

We studied important characteristics of leaf litter and canopy cover in a tropical dry forest in coastal Jalisco, Mexico. Tropical dry forests are characterized by highly seasonal precipitation, which creates a unique combination of drought-deciduous trees, arborescent cacti, and distinct riparian vegetation. Two distinct habitat types -- upland and arroyo forests -- show extreme variation in vegetation. We investigated variations in leaf litter volume, invertebrates, and moisture content in upland habitats (which tend to have more deciduous trees) and arroyo habitats (which occur along temporary streams and have denser canopy cover). We sampled two transects, each traversing a gradient of habitats from arroyo to upland forest. We found that the arroyo habitats had more leaf litter with higher moisture content than the upland forests. For invertebrates, one transect had the largest abundance and diversity of insects in the arroyo, whereas the other transect had the largest abundance and diversity in the upland forest. For canopy cover we also found contradictory results: one transect had more canopy cover in the arroyo, but the other had more in the upland forest. Results from this study add information about the availability of invertebrate food sources for species that forage in the leaf litter during the dry season. Our results also suggest that canopy cover and leaf litter insects do not always follow a predictable pattern in tropical dry forests, especially in years — such as winter 2010 — where the El Niño southern oscillation brings rare winter precipitation.

SETTLEMENT AND FISHING PATTERNS: GIS MODEL OF AN ARCHAEOLOGICAL LANDSCAPE
Barrett, Carrie
Faculty Mentor(s): Steve Hackenberger, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

Archaeologists study a variety of topics within the research subject of settlement dynamics, which helps to explain how people understand the world around them. One of these areas of interest is how people provide for their food needs. Winter settlement patterns in Hells Canyon are evaluated using Geographic Information System models. Least cost analysis predicts the land route from villages to fishing rapids locations, which can be reached within specified travel distances over different terrain types. Least cost analysis maps are created for four fishing rapids in relation to concentrated house settlements. Routes to fishing rapids locations are predicted using slope, and distance and direction of travel. It is suggested that complexes near rapids will be placed on the landscape in a way that would allow people to travel to them with minimal effort; thus indicating a high likelihood that the habitation sites were chosen because of their accessibility to the rapids for use as fishing locations on a regular basis. Comparisons between the four areas suggest that: 1) house settlements are placed on the east or west side of the river so that the greatest area of open canyon will be on the same side of the river as the settlement, and 2) fishing rapids are located within distances and over terrain of minimal travel effort. This research approach can be further developed in order to help explain settlement dynamics, fishing practices, and cultural landscapes.

U.S. DOMINATION THROUGH THE FEMINIZATION OF LATIN AMERICA: A STUDY OF POLITICAL CARICATURE
Bator, Jeanine
Faculty Mentor(s): Christopher Schedler, English; Melissa Johnson, English; Michael Ervin, History

8 (Oral Session 9:30-10:50 in 137A)

Historically, the relationship between the United States and Latin America has been tenuous, at best. One source of the unstable bond is the U.S. desire to exert its control over the Western Hemisphere by implementing self-benefitting policies, such as the Monroe Doctrine, that limit the autonomy of Latin American nations. While U.S. governmental policy is a factor in the suppression of Latin American autonomy, the policies have also influenced public perception through the medium of political caricature. To spin U.S. policy to gain the support of the public, American cartoonists utilized familiar images, such as female figures to represent Latin America and the masculine Uncle Sam to represent the United States, in their attempt to get the public to back U.S. policies. To date, little research has been done on the use of the female image in political cartoons representing the relationship between the United States and Latin America. Therefore, this paper examines the use of the female image in both American and Latin American cartoons and the way the United States came to dominate the region through the propaganda of political cartoons.
The Wilderness Act recognizes the value of recreation, protecting ecological systems, and opportunities for scientific inquiry. However, the cumulative impact of recreation on wilderness campsites is transforming landscapes to a degree that takes centuries to restore. Our research focused on changes in campsite spatial distribution, impacted areas, and use over time at Waptus Lake in the central region of the Alpine Lakes Wilderness, Washington. Impacts were assessed at 42 campsites located around the eastern and northern margins of the lake. A visitor use analysis identified declining visitation from 1996 to 2008. Despite decreased use, 34% of the campsites had a “severe” rating according to the Bob Marshall Rapid Estimation Procedure. Some campsites showed signs of improvement between 1985 and 2009; however, results also indicated that campsite soils are more susceptible to compaction due to texture and depletion of organic matter. Soils prone to compaction are less responsive to campsite rehabilitation efforts; therefore, it may be more effective to consider policy changes focused on curtailing the spatial distribution of impact. Recreation impacts campsites by decreasing the density and composition of vegetation and organic soil horizons, followed by soil compaction and erosion. This research is significant because absence of consistent campsite impact monitoring programs and reliable visitor estimates have led to irreversible environmental degradation. Waptus Lake and the Alpine Lakes Wilderness are particularly vulnerable to these threats due to proximity to the growing Seattle metropolitan area.

Wilson Creek is a tributary of the Yakima River that flows through the CWU campus and the city of Ellensburg in two branches. A channelized section of the stream, West Branch of Wilson Creek, flowed between two CWU dormitories, Courson Hall and Muzzall Hall prior to their demolition. A new channel was constructed to make the stream more natural by including meanders, large woody debris and cobble/gravel substrate. The objective of this study was to determine how the stream ecosystem has changed after being diverted into a newly created channel. I studied the fish community to determine if changes had occurred before and after the stream had been diverted. Several species inhabit Wilson Creek with brook trout being the most common species inhabiting the sections flowing through Ellensburg. Fish were sampled with a backpack electrofisher and all species were identified, enumerated, measured and released at their original capture location. Data collected prior to the diversion as well as after were compared and analyzed to note any changes in the fish community, both in the number of juvenile and adult fish as well as species. Initial results indicate that fish species reestablished populations quickly in the new channel. Brook trout appeared to reestablish their population to be the dominant species in the channel both in number and biomass.

CWU is a signatory to the “American College & University Presidents’ Climate Commitment” (http://www.presidentsclimatecommitment.org/) which commits the college to working towards campus wide climate neutrality. The first step in the process is to develop an accounting of current greenhouse gas emissions, based on the Clean Air--Cool Planet methodology (http://www.cleanair-coolplanet.org/toolkit/). Future efforts involve taking steps to reduce the emissions and document the changes. CWU is at the point of completing the initial inventory step. This presentation will define the meaning of a “carbon footprint,” outline the inventory process and its results, and translate the data into the effective “carbon footprint” per FTE student.
LONG-TERM EFFECTS OF THE ANTIDEPRESSANT, BUPROPION (WELLBUTRIN), ON THE ROUNDWORM, C. ELEGANS’, BEHAVIOR
Bell, John
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

40 (Morning Poster Session in Ballroom)

Bupropion is a norepinephrine and dopamine reuptake inhibitor. It is used as an antidepressant and as a facilitator of smoking cessation. However, there are some possible side effects from taking the drug such as seizure and behavior changes such as anxiety, panic attacks, trouble sleeping, or becoming more depressed. This drug has been chosen for research because not a lot of research has been done involving this medication; and we would like to know more about it. Caenorhabditis elegans (C. elegans) is free-living soil roundworm that are used as the experimental model. C. elegans is easy to cultivate in the laboratory, and much is known about their nervous system. Wild-type C. elegans were grown on agar plates from eggs to adults (three days) containing different doses of bupropion (0.4 mg/mL, 0.2 mg/mL and 0.05 mg/mL). General behavioral observations were recorded. The worms grew slower which was more severe with increasing concentration. In addition to observed defects in movement and egg laying, we also were able to quantify defects in pharyngeal pumping. There was a significant difference between the 0.2 mg/mL and 0.4 mg/mL bupropion when compared to untreated controls. These observations suggest that bupropion is affecting the worms’ nervous system in a manner different from dopamine or the invertebrate version of norepinephrine, octopamine. It is possible that bupropion is affecting pathways associated with the neurotransmitter, acetylcholine (Ach). The next step is test whether bupropion is affecting behaviors involved in acetylcholine function. These studies may identify affects of bupropion not previously reported.

REFORMS OF THE WANDERING THEATRE TROUPES IN EIGHTEENTH CENTURY GERMANY
Bell, Maggie
Faculty Mentor(s): Nadine Pederson, Theatre Arts

9 (Oral Session 9:30-10:50 in 137B)

In early eighteenth century Germany, theatre culture was divided between French drama and Italian operas of the aristocratic court theatres, and groups of wandering troupes of actors who tried to earn a paltry living by traveling to different towns and performing largely improvised crude performances. These performers enjoyed a reputation that was roughly equated with thieves and vagabonds in comparison to French actors and Italian opera singers of the princely courts. There was not an established national theater in Germany like the Comédie Française, or a central metropolitan location of culture such as Paris. Germany was still divided into over 300 small city-states, each city aligned with its own laws and almost invariably ruled by despots. German acting troupes traveled the country to bring theater to their audiences, setting up stages in market places, in the back of taverns, or wherever they could. Due to their poor education and women’s reputation as prostitutes, performers in general were viewed as untrustworthy. If the disparity of their lives was a symptom of the social condition that indigenous German actors found themselves in during the early 1700s, it was the efforts of Fredericke Caroline Neuber (1697-1770) and Johann Christoph Gottsched (1700-1766) to transform these nomad players into performers who could read and perform drama written in German. As a result, Neuber and Gottsched made a permanent impact on German theater. This paper explores the reception of their approach in reforming these actors, and their effect on the actors’ performance styles.
NITRIC OXIDE MEDIATES HOOKWORM INFECTION IN HAMSTERS

Berndt, Amanda; Moesch, Stephanie; McNutt, Sara
Faculty Mentor(s): Blaise Dondji, Biological Sciences

40 (Morning Poster Session in Ballroom)

Hookworm infection is a major cause of anemia, malnutrition, growth delay and cognitive defects in resource poor countries. Human and animal studies suggest that infection with these intestinal nematodes is associated with impaired cellular immunity, characterized by reduced lymphocyte proliferation in response to both parasite and heterologous antigens. In vitro studies have shown that nitric oxide (NO) is one of the leading agent causing impaired cellular responses. Spleenocytes from infected hamsters secreted more NO in culture than did those from naive animals. In order to further identify the role of NO in hookworm pathogenesis and pathology, we conducted an experiment where the production of NO was inhibited using N-Monomethyl-L-Arginine (L-NMMA). Hamsters were infected with 100 third stage larvae of the hookworm, Ancylostoma ceylanicum. Hamsters that received L-NMMA showed lower worm burden (4+2) at day 36 post-infection (PI). The worm burden in the control group, without L-NMMA was (21+4, p < 0.005). Similarly, the L-NMMA group had lower egg count as from day 22 PI to day 36 PI. Anemia was assessed by measuring the hemoglobin levels and showed that the hamsters in the control group were more anemic. Together, these data suggest that NO modulates the clinical outcome of hookworm infection.

INVESTIGATION OF SURFACTANT & POLYELECTROLYTE SOLUTIONS INTERACTIONS WITH WATER-SOLUBLE ORGANIC COMPOUNDS AND SUBSEQUENT ADSORPTION OF THE COMPLEX ONTO THE SURFACE OF TITANIUM DIOXIDE

Best, Brittany; Scheffelmaier, Ryan
Faculty Mentor(s): Dion Rivera, Chemistry

29 (Oral Session 1:50-3:30 in 202)

Previous research has shown that a surfactant in solution with an oppositely charged polyelectrolyte will undergo force aggregation to form a mixed polyelectrolyte/surfactant complex (PSC) at concentrations well below the critical micelle concentration (cmc) of the surfactant. These PSC can remove hydrophobic compounds from aqueous solution and subsequently adsorb onto a charged surface. For this study ultra-violet spectroscopy was employed to study the interaction of a cationic surfactant, cetylpyridinium bromide monohydrate (CPBM), and an anionic polyelectrolyte, poly(sodium-4-styrenesulfonate), with a positively charged titanium dioxide (TiO$_2$) surface. The hydrophobic compounds used in this study were two water-soluble organic dyes, phenol red (PR) and bromothymol blue (BB). The ratio of surfactant to polyelectrolyte required for PSC formation and adsorption onto TiO$_2$ was found to be similar between the two dyes used, around 300:1. However, the amount of dye removed varied depending on the dye used, some PR was still in solution whereas BB was fully removed from solution. To further understand this system, the ionic strength was increased by the addition of a salt solution. The surfactant to polyelectrolyte ratio for PR and BB was not significantly altered. The amount of PR removed from solution decreased, whereas BB was again fully removed from solution. This suggests that increased ionic strength decreases PSC formation by decreasing the surfactant cmc, this was confirmed by surface tension measurements.
A JOINT PARTNERSHIP: EHS AND CWU WORKING TOGETHER TO INVESTIGATE NITRATE LEVELS IN THE ELLensburg AREA
Best, Brittany; Hodges, Dave; Hutzenbiler, Brandon; Seely, Tirra
Faculty Mentor(s): Dion Rivera, Chemistry

Ellensburg High School and Central Washington University have for the past few years been working together on a National Science Foundation-funded project called Yakima WATERS. A recurring pollutant in the Yakima River watershed is nitrate (NO$_3$), a primary product of internal combustion engines, and a major component of commercial fertilizer. Nitrates in the Kittitas Valley have become a concern because of the combination of agricultural activity and the high traffic use of Interstate 90 that runs directly through the valley. Nitrate is one of the primary sources for acid rain and shows a direct effect to global warming and growing smog problems across the nation. The level of NO$_3$ contamination in Ellensburg air was determined through a series of aerosol tests conducted from an air filtration system located on the roof of Ellensburg High School during the 2009-2010 school year and using standard UV-Visible methods. Samples collected during the 2009-2010 school year were then compared to the findings from the 2008-2009 school year. Previous years testing showed that Ellensburg air exceeded the minimum contaminant level (MCL) set at 10 ppm. Adverse health effects at this concentration include methemoglobinemia in infants and long-term exposure results in diuresis and hemorrhaging of the spleen. Continuation of this testing has shown that a long term monitoring system should remain in place.

A JOINT PARTNERSHIP: EHS AND CWU WORKING TOGETHER TO INVESTIGATE NITRATE POLLUTION IN WET DEPOSITION IN THE ELLensburg AREA
Best, Brittany; Smart, Joelle; Hodges, Dave
Faculty Mentor(s): Dion Rivera, Chemistry

Central Washington University and Ellensburg High School (EHS), in a National Science Foundation-funded partnership called Yakima WATERS, are working to investigate water quality in the Ellensburg area of the Yakima Watershed (YW). A recurrent pollutant in the YW is nitrate (NO$_3$) the primary product of internal combustion engines and a major component of commercial fertilizer. The level of NO$_3$ pollution in the YW is of concern as it is one of the key precursors to acid rain and can cause the eutrophication of lakes and slow-moving streams. The main sources of NO$_3$ pollution in the Kittitas Valley are exhaust from the heavily traveled Interstate 90 and commercial fertilizer that is widely used across the valley, which is known for its strong agricultural presence. In summary, samples of water from water-collecting instruments on the EHS roof were gathered and analyzed at EHS using standard UV-Visible methods to determine the level of NO$_3$ contamination in Ellensburg precipitation. Currently, EHS students and WATERS fellows are analyzing the collected samples. Results from previous years of air quality testing have shown that NO$_3$ levels in Ellensburg air exceed the minimum contaminant level (MCL) set at 10 ppm. Adverse health effects at this concentration include methemoglobinemia in infants and long-term exposure can result in diuresis and hemorrhaging of the spleen. Continuation of this testing has shown that a long term monitoring system should remain in place.
Amphibian species worldwide are declining at alarming rates due to a multitude of factors; diseases in particular have been linked to population declines, extirpations, and species extinctions. Saprolegniosis, a disease caused by water molds, has been implicated in mass mortalities of amphibian embryos and larvae. Until recently, water mold infection experiments have not used accurately identified water molds, which requires genetic analysis, therefore the pathogenicity, host specificity, or possible pathogen-pathogen interactions of water molds remains unknown. In this study, pathogen-pathogen interactions were investigated by exposing Northern Leopard Frog embryos (Lithobates pipiens) to three genetically identified species of Saprolegnia (S. ferax, S. diclina, and S. anisospora) in a fully factorial experiment. Treatments included all possible combinations of the three Saprolegnia species and a control treatment with no pathogen present. Embryo survivorship was calculated and larval fitness was assessed for each treatment. Analyses revealed interactions among species of Saprolegnia resulting in decreased embryo survivorship in multiple pathogen treatments. In single pathogen treatments of S. diclina and S. ferax embryo survivorship was not significantly different from the control. In contrast, the combination of S. ferax and S. diclina significantly reduced amphibian embryo survivorship as compared to the control treatment (P <0.0001). Understanding these pathogen-pathogen interactions are important in assessing the overall effect of Saprolegnia infections on amphibian embryos, and will help determine which Saprolegnia species, or combination of species, are responsible for amphibian embryo mortalities in the Northern Leopard Frog.

THE SENSATION OF THE MASCULINE IN WILKIE COLLINS’S THE WOMAN IN WHITE
Brandon, Chelsea
Faculty Mentor(s): Christine Sutphin, English

Nineteenth-century Victorian sensation novels are often trivialized as merely “popular” or throwaway fiction. However, in novels such as Wilkie Collins’s The Woman in White, the use of the sensation genre masks a deeper discussion of the development of masculinity within Victorian society. In The Woman in White, Collins uses his main male character, Walter Hartright, to transform the novel into a commentary on the constructed model of Victorian masculinity. By showcasing Walter as a transformative masculine figure Collins reveals the lack of a single cohesive “masculine model” for society as Walter transforms into a model that is essentially flawed because Walter’s character adheres only to a very one-dimensional model. Collins uses Walter’s character within the novel to point out, almost poke fun at, the masculine ideals of the Victorian period. Collins critiques the masculine model presented by Walter through the examination of his transformative journey from a weak masculine model into a robust masculine figure, his impact on the arrangement of the story, his relationship to the female characters, and finally by critiquing the structural basis of the story’s ending as it appears to be almost satirical in nature. This paper argues that Collins sets up Walter’s essential position in the novel and then uses this position as a masculine figure to critique the social order and to point out the lack of a viable masculine model for the Victorian period.
ANALYSIS OF TERRESTRIAL SNAIL SHELL CONCENTRATIONS AT HOUSE SITE 2, TRYON CREEK, HELLS CANYON, OREGON

Braun, Joshua

Faculty Mentor(s): Steven Hackenberger, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

House 2 at Tryon Creek (35-WA-288), Hell’s Canyon, Oregon was first excavated in 1991 and 1992. Excavations of House 2 within the Tryon Creek Site uncovered distinct concentrations of land snails (genus Oreohelix) within different levels and activity areas (ca. 1600-500 BP). Analyses of the assemblage have continued as part of undergraduate and graduate research projects at CWU. This poster examines size and distribution of land snails within different areas and levels of the house. This work builds off of previous analysis by Marc Fairbanks on artifact distribution within House 2. Snail shells were counted by size and completeness and tabulated according to excavation and stratigraphic unit. These data are then linked to spatial data in ARCGIS, where the data are analyzed both visually and statistically to define patterns of snail shell concentrations. Charts and raster grids, including Nearest Neighbor analysis and Inverse Distance Weighting (IDW), are tools which help define spatial patterns. The results of these analyses help determine the types of activities which produced the snail concentrations. These activities may include consumption areas, discard in preparation areas, and discard in refuse areas.

MAXIMIZING STARCH FOR HYDROGEN PRODUCTION IN CHLAMYDOMONAS REINHARDTII

Brooks, Jenna; Perry, Jessica; Young, Ryan; Sotelo, Emily

Faculty Mentor(s): Mary Poulson, Biological Sciences

40 (Morning Poster Session in Ballroom)

The race is on to find a cost- and energy-efficient way to produce renewable energy. Hydrogen has potential for a lesser-polluting fuel source however currently more than 95% of the hydrogen produced globally is done so using fossil fuels. Biological hydrogen production would reduce carbon emissions and the human footprint on earth. Many photosynthetic algae are capable of producing hydrogen including the unicellular green alga Chlamydomonas reinhardtii. Oxygen, which is normally produced in photosynthetic reactions, strongly inhibits algal hydrogen production. Therefore, photosynthesis must be inhibited for hydrogen production to occur. Without photosynthesis, algae metabolize organic compounds such as starch for hydrogen production. Some algal strains have higher hydrogen production capacity due to higher starch content but as yet environmental parameters that determine starch-production capability in algae are largely unknown. We investigated the effect of environmental parameters on photosynthetic efficiency and starch production for C. reinhardtii. Growth media for the algae were bubbled with 3% CO₂ or air and were either agitation or allowed to remain still. Cultures were grown under constant light versus light dark cycles. Efficiency of the photosynthetic reaction center, PSII, was found to be up to 50% greater during the mid-exponential growth phase for the alga, as compared to before or after that phase, for all growth environments. Preliminary starch assay results suggest that light cycles are more important for starch production than agitation or bubbling with high CO₂. Algae grown in constant light contained up to two times more starch than algae grown in light/dark cycles.
NEW VALUES, NEW IDENTITIES: SECOND LANGUAGE LEARNERS IN THE ENGLISH COMPOSITION CLASSROOM

Brooks, Katie
Faculty Mentor(s): Patsy Callaghan, English

35 (Oral Session 3:40-5:40 in 140)

With the development of English as a global lingua franca, the number of English language learners all over the world has continued to grow. Many such learners who reside in the U.S. or come to the U.S. for ESL instruction later join the mainstream academic community to work toward a degree and must enroll in English composition classrooms where instructors may or may not be aware of—or prepared to accommodate—their unique needs. With the growing number of ESL students engaged composition courses, I believe it is important to question the responsibilities of composition teachers and ask what they, who may receive little or no training in ESL learning or writing, should know about the needs and difficulties unique to English language learners. In synthesizing current discussions of this topic, I have encountered three main concerns that it would behoove composition teachers to be aware of if they are to understand the struggles their ESL students face, which are: varying culturally-based definitions of literacy, the disparate values among academic communities that arise from cultural differences, and the need to establish a new writer identity that conforms to these values. Consciousness of these issues and how they are manifested in the English composition classroom should equip teachers to more effectively question their own assumptions about literacy and learning and to help students identify their assumptions as well.

HIGH SATURATED-FAT DIET AND DEFICIENT NICOTINAMIDE NUCLEOTIDE TRANSHYDROGENASE ARE CONTRIBUTING FACTORS TO MITOCHONDRIAL DYSFUNCTION IN C. ELEGANS

Bryner, Stephanie
Faculty Mentor(s): Carin Thomas, Chemistry; Lucinda Carnell, Biological Sciences

40 (Morning Poster Session in Ballroom)

Type 2 diabetes is a worldwide epidemic affecting over 246 million people, but the cellular mechanisms that initiate the disease are still unclear. Recent research indicates that there may be a link between mitochondrial dysfunction and decreased insulin. The aim of this work was to investigate the role of a mitochondrial enzyme, Nicotinamide Nucleotide Transhydrogenase (NNT), in maintaining mitochondrial function in animals exposed to high-fat diets enriched with stearic, and oleic acid. These studies were performed using the nematode, Caenorhabditis elegans, and included the examination of both wild-type nematodes and two different deletion strains lacking the C. elegan’s ortholog of NNT, nnt-1. The different strains were grown on high-fat and normal diets and the function of mitochondria in these nematodes was compared using oxygen consumption to measure respiratory rate and fluorescent imaging techniques to indicate mitochondrial reactive oxygen species (ROS) production and membrane potential. Our results show that, when grown on normal diets, the nnt-1 mutant nematodes had lower respiratory rates and lower mitochondrial membrane potentials as compared to wild type, suggesting a defect in mitochondrial function. In addition, our results show increased mitochondrial dysfunction and reactive oxygen species production in nematodes grown on a high saturated-fat diet as compared to normal and unsaturated-fat diets. The results suggest that NNT plays a role in maintaining mitochondrial respiratory function and that a high saturated-fat diet increases mitochondrial dysfunction via increased ROS production and decreased energy production.

SWEET LORRAINE

Cahill, Lorraine
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

My fashion line originated from sipping wine around my grandparents’ pool in the warm summer breeze, listening to Frank Sinatra sing me his favorite song, Sweet Lorraine. The ladies throughout the generations of my family inspire me by their classy, Ralph Lauren influence, and their cute, unique styles. I love anything that makes me smile, and I love the color pink. I will be showing one in a line of three garments; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in Milo Smith Theatre in McConnell Hall.
SELF-RELIANCE AND THE FRONTIER MYTH AS DISPLAYED IN COMIC BOOK FILMS OF THE PAST DECADE
Candella, Jimmy-Dean
Faculty Mentor(s): Alain Beauclair, Philosophy

19 (Oral Session 1:00-1:40 in 201)

This paper takes an exploration into the evolution of America's premier philosophical ideologies and their cultural adaptation into comic book superhero movies of the last decade. These ideologies are grounded in the Frontier Myth, a romanticization of the American Wild West, and the Cowboy Myth, the idealization of self-reliance among American cowboys. I use the philosophical writings of Ralph Waldo Emerson on these ideologies in conjunction with contemporary comic book superhero movies. This synthesis creates a historical, anthropological, cinematic and philosophic frame for understanding of the evolution from the Wild West to the silver screen and ultimately how these ideologies have come to shape our understanding of ourselves as Americans.

RPE AND GLUCOSE RESPONSE DURING HIGH INTENSITY INTERMITTENT CYCLING WITH AND WITHOUT A PRE-EXERCISE FEEDING
Carriker, Colin; Pritchett, Kelly; Pritchett, Robert
Faculty Mentor(s): Robert Pritchett, Nutrition, Exercise, & Health Sciences; Kelly Pritchett, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

INTRODUCTION: Research has suggested that perceptions of effort may be attenuated during exercise after the ingestion of a pre-exercise feeding. However, little research has examined the effects of a pre-exercise feeding on perceived effort during high-intensity interval cycling. PURPOSE: To examine the effects of a pre-exercise feeding on ratings of perceived effort (RPE) during high intensity intermittent cycling. Furthermore, to evaluate the association between RPE and blood glucose (GLU) levels. METHODS: 10 moderately trained athletes participated in this counterbalanced, cross-over, repeated measures study. Participants completed two 50-minute intermittent exercise protocols (5 min @ 65% of max, 3 x 10 s Wingate sprints). During one trial, participants consumed 400mL of water and a standardized, nutritional bar (BAR) 15 minute prior to the exercise session. During another trial (CON), participants consumed 400 mL of water (BAR and CON counterbalanced). RPE and GLU measurements were taken every 8 minutes during the exercise session. RESULTS: There was no interaction (treatment x time) for RPE between the two trials. RPE increased significantly (p < 0.05) over time in both trials. Repeated-measures MANOVA showed no interaction between GLU and RPE over time. CONCLUSIONS: Results show no effect of a pre-exercise feeding on RPE during high intensity intermittent cycling. RPE showed no association with GLU during BAR or CON. Although shown influential in other exercise paradigms, current results suggest that, during interval cycling, glucose has minimal effect on RPE which is likely overridden by factors associated with an acute metabolic load.

GARAGE THEATRE: A RETROSPECTIVE LOOK AT STUDENT PRODUCED THEATRE
Carter, Andrew
Faculty Mentor(s): Christina Barrigan, Theatre Arts

3 (Oral Session 8:00-9:20 in 137B)

A retrospective look at how a college student produces musical theatre. I will go over all the details of Athena Stage Productions 2009 summer adaptation of You’re a Good Man, Charlie Brown. This will include how we determined the show, and why we did the show in the first place. As well we will talk about budgeting, and marketing and the use of social networking as a tool. Furthermore we will touch on new technologies and processes that made this production so educational.
AMBIENT AEROSOL COLLECTION IN ELLENSBURG: EQUIPMENT SETUP ON CWU’S DEAN HALL

Casique, Hector; Mendoza, Cesar
Faculty Mentor(s): Anne Johansen, Chemistry

40 (Morning Poster Session in Ballroom)

Particulate matter (PM) is an air pollutant that can harm our health and environment. It is made up of numerous components, including acids, organic chemicals, metals, soils, and dust particles, and the size of individual particles ranges from a few nanometers to several tens of micrometers. Aerosol particle size has been directly linked to their probability for causing health hazards, as diminutively sized particles can readily pass through the upper respiratory tract and enter the lungs. Once inhaled, they can traverse cell membranes and affect the lungs, heart, and vascular system thus greatly increasing adverse health effects. PM is emitted from various sources like construction sites, farm fields, fires, power plants, and automobiles. To study such particle matter, a High Volume Cascade Impactor (HVCI) was setup on the CWU campus’ Dean Hall roof to be used to collect four particle size fractions from ambient air. The collected samples will be employed in classroom work (Environmental Chemistry, CHEM345) and for research purposes to study how particles are carried over extensive distances by wind from, e.g., Seattle and China, and how they can affect regional soil, lakes, rivers, and our health.

SURGERY, SOUL, AND POETICS: HOW POETRY SAVED MY LIFE FROM THE TRAUMA OF CHILDHOOD MOLESTATION

Cavazos, Pedro
Faculty Mentor(s): Karen Francis-McWhite, English

35 (Oral Session 3:40-5:40 in 140)

This study centers on poetry therapy as defined by the National Association of Poetry Therapy, as well as the research and scholarship of Dr. Nicolas Mazza, the country’s foremost authority on poetry therapy. My focus is on two of three modes of poetry therapy (1. Receptive/prescribed and 2. Creative/expressive), analyzing the poetry of Lucille Clifton and Sharon Olds, and how their poetry relates to the prescriptive mode of poetry therapy and contributed to my personal growth and healing. Using a subjective creative non-fiction narrative, I propose a new component to the creative mode of poetry therapy, Human Geological Poetics (HGP), which likens the geological process of rock formation to the human body, trauma, and behavior. Ingenious rock formation is like that which is passed down in the bloodline at birth. Metamorphic rock is like traumatic events that alter the core of who we are. And sedimentary rock is how we carry ourselves throughout daily events. The purpose of this research is to add to the ever-growing database of poetry therapy by suggesting new poems to the list of prescribed poems for healing the wounds of molestation and sexual trauma, and to add a new poetics or pedagogical approach to the creative/expressive mode for practitioners of poetry therapy.

NONCONSENTUAL SEXUAL BEHAVIOR: THE ROLE OF WORDING AND SCALE RANGE ON PERCEPTIONS AMONG COLLEGE STUDENTS

Chavez-Gonzalez, Diocelina
Faculty Mentor(s): Wendy Williams, Psychology

41 (Afternoon Poster Session in Ballroom)

Hatterly-Freetly and Kane (1995) demonstrated a reliable influence on the perception of rape based on the familiarity between the victim and perpetrator. In general, college students rated nonconsensual sexual behavior as less unacceptable when the perpetrator was dating, living with or married to the victim as opposed to the individuals being acquaintances. Brett and Williams (2005) replicated that effect. In both studies, participants were asked to read brief rape scenarios and rate the behavior of the perpetrator on a four-point Likert scale (1 = completely unacceptable- 5 = completely acceptable). One important methodological flaw was noted. Over 95% of participants only used the ratings between 1 and 2; ratings above the cutoff for acceptability were rarely used. In the current study, 60 college students rated the acceptability and/or unacceptability of five different scenarios ranging from acquaintance to marital rape. The response range was limited to unacceptable ratings, in an attempt to clarify the pattern of unacceptability ratings related to rape as a function of familiarity. A minor wording change was also included to minimize rape ambiguity. By adding the phrase “Despite her verbal and physical protests”, the current study tested to see whether the decline in unacceptability ratings in previous studies may have been due to differential interpretation of the phrase “Despite her protests, intercourse occurs.” Results are discussed in terms of the critical role of the wording used in descriptive scenarios, and the importance of selecting useful Likert-scale ranges to assess the unacceptability of stranger and acquaintance rape.
CHARACTERIZATION OF ELECTROTAXIS BEHAVIOR IN CAENORHABDITIS ELEGANS

Chrisman, Steven  
Faculty Mentor(s): Lucinda Carnell, Biological Sciences;

25 (Oral Session 1:50-3:30 in 137A)

Electrotaxis, the orientation and movement of an organism in an electric field is a conserved behavior across many different organisms and cell types, and is used for detection of pray or navigation in its environment. The roundworm, *C. elegans*, also has the unusual ability to sense and navigate to the negative pole in a direct current (DC) electric field and is an excellent choice for a sensory study because they have a nervous system of 302 neurons whose connections are known. *C. elegans* sense both polarity and strength of an electric field by uninterrupted crawling toward the negative pole. We have further characterized electrotaxis behavior in *C. elegans* by quantifying both direction and velocity of the worms' migration to the negative pole. The worm also responds to a decrease in the field strength by reversing its direction and moving away from the negative pole. In examining the neural basis for this behavior, we have identified a mutant, *eat-4*, that is severely disrupted in electrotaxis. The *eat-4* mutant has deficits in direction, velocity and is completely defective in reversing when the field is decreased. With the use of transgenic worm strains that have had the EAT-4 defective protein replaced with a normal EAT-4 protein in specific neurons, we have determined that the sensory neuron, AWC, recovers the worm's ability to sense direction. Identification of the neurons mediating electrotaxis in *C. elegans* will provide insights into how organisms in general detect and response to changes in electric field strength.

SYNTHESIS OF NOVEL STRAIGHT CHAIN BORINIC ACIDS AS POTENTIAL HIV-1 PROTEASE INHIBITORS

Clayton, Donald  
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

4 (Oral Session 8:00-9:20 in 140)

Implementation of antiretroviral treatment has drastically increased both the survival and quality of life of HIV/AIDS patients. While there has been significant success using these life saving drugs, several problems have arisen during their use. Among these major setbacks include the rising incidences of resistance, low bioavailability, and toxicity. Consequently, there is an urgent need for the development and production of new inhibitory compounds with increased resistance profiles, higher bioavailability, and decreased toxicity. Recent studies have demonstrated that boron modified peptides are effective inhibitors of aspartic proteases. Furthermore, these boronated compounds have exhibited dual-inhibition along with a high affinity toward both wild-type and mutant strains of the enzyme HIV-1 protease. For these reasons, we are synthesizing novel borinic acids designed to demonstrate both competitive and associative inhibitory action toward HIV-1 protease.

RADIO ANALYSIS: SONG SPINS VERSUS BURNOUT

Cleveland, Alisha  
Faculty Mentor(s): Yvonne Chueh, Mathematics

5 (Oral Session 8:00-9:20 in 201)

In radio, one of the biggest challenges a program director faces is burnout. Burnout means a song was played so many times the listeners are tired of the music. One way of determining burnout is to look at the number of spins a song has had, spins being how many times a song was played by every DJ in the industry. There's no known precise number a program director sees and decides it's time to decrease spins; instead, they use their instincts. Then, when you look at the spin charts, songs gradually begin to fall as program directors decide listeners have tired. The issue to be addressed is burnout throughout genres. Another aspect will be if there is a common mean spin value that program directors sense and then decrease spins. Since there is one element, a one-way analysis of variance will be used with genre as the treatment. Also, in order to look at genres, the song chosen to represent will be Rihanna's song *Rude Boys* because she's on multiple charts. These ideas could be crucial to determining the impact radio has on music and how they can increase listenership, and in effect, advertising revenue.
ACACIA GUM AS A FAT SUBSTITUTE PRODUCES AN ACCEPTABLE REDUCED-FAT BROWNIE
Cohoe, Theresa; Engelsen, Liv; Norkoski, Anna
Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

High-fat diets contribute to the obesity epidemic in the United States. Using fat substitutes to create an acceptable product while lowering the content of saturated fat could result in significant health benefits. To aid in the development of such a product, a single-blind experimental study was carried out to determine the acceptability of acacia gum as a fat substitute in fudge brownies. Approximately 60 human subjects were used in the sensory tests including difference tests, moistness, sweetness, chewiness, texture preference and overall preference. Objective tests were conducted for product height and peak penetration & compression forces. An unaltered recipe for Fudge Brownies was used as a control. Half of the butter was taken out and replaced with acacia gum for the first experimental group to create a “Reduced-Fat” brownie. A “Low-Fat” brownie was created by replacing all of the butter with acacia gum. Analysis of Variance was performed on all data and Tukey’s LSD was calculated if a statistical significance was noted. The results of the study revealed that while the low-fat brownie was significantly less preferred, the reduced fat brownie had textural properties comparable to that of the control and was not significantly different in overall preference. In addition, objective testing revealed that the low-fat brownie produced a significantly taller product while the reduced-fat brownie required significantly less compression force than the control. We can conclude that acacia gum is an acceptable fat substitute in fudge brownies when replacing 50% of the fat.

DAILY AROUSAL LEVELS’ EFFECT ON A CHIMPANZEE’S CATEGORICAL SIGN USAGE
Cole, Melissa; Herigstad, Tracy
Faculty Mentor(s): Mary Lee Jensvold, Chimpanzee and Human Communication Institute

28 (Oral Session 1:50-3:30 in 201)

The chimpanzees at the Chimpanzee and Human Communication Institute (CHCI) modify the form of their signing to one another during high-arousal interactions. During post-conflict interactions arousal levels impact signing rates and variety. As young chimpanzees, anticipation of a high-arousal event elicited increased levels of signing, whereas the event itself elicited increased vocalizations. This study examined the relationship of Dar’s arousal levels and his categorical sign usage. Higher arousal levels correlated negatively with the overall number of categories used, as well as the categories Locative, Modifier, and Verb. When Dar’s arousal was low he had higher variation in his signs, as evidenced by higher numbers of different categories used. He was also more likely to use locatives, modifiers, and verbs when his arousal level was low.

SYNTHESIS OF GLIONITRIN A: A POTENTIAL ANTIBIOTIC AND ANTICANCER COMPOUND
Conn, Stephanie; Wexler, Alex
Faculty Mentor(s): Stephen Chamberland, Chemistry

40 (Morning Poster Session in Ballroom)

Glionitrin A is a natural product isolated from acidic coal mine drainage in South Korea. Tests performed indicated glionitrin A may be a potential anticancer and antibiotic compound. The synthesis plan of glionitrin A involves 13 steps featuring the joining of two precursor compounds, 1-methyl-2,5-piperazinedione and 2-iodo-4-nitrobenzoic acid, which were synthesized in a total of five steps. Thus far, 1-methyl-2,5-piperazinedione and 2-iodo-4-nitrobenzoic acid have been synthesized.
WASP’S IT ALL ABOUT?: EVERYTHING I’VE LEARNED ABOUT LOCAL YELLOWJACKETS AND PAPER WASPS THAT’S ACTUALLY INTERESTING!
Corrigan, Shawn
Faculty Mentor(s): Jason Irwin, Biological Sciences

25 (Oral Session 1:50-3:30 in 137A)

In four years of studying the winter physiology of local wasps, I have been forced to become a student of their abundance, nesting habits, diets, and general behavior. For most people, wasp physiology is as fascinating as, say, watching water come to a boil. I will discuss types of wasps, where they nest and why they nest there, what they eat, and why they sting. All questions are welcome.

REDUCED FAT AND FAT-FREE CREAM CHEESES ARE ACCEPTABLE SUBSTITUTIONS FOR BUTTER IN LEMON COOKIES
Crosson, Chad; Hahn, Katie; Reynolds, Emily
Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

This research project was designed to test if reduced fat and fat free cream cheeses were acceptable fat substitutes in a lemon cookie recipe using a commercial boxed cake mix. According to the USDA, Americans’ over-consumption of fat is a major contributor to many diet-related diseases. Reduced fat and fat free cream cheeses were chosen as a butter replacement because of their low fat content, firm texture, and creaming ability. The three variations of the recipe were a control using butter, a reduced fat variety using reduced fat cream cheese, and a low fat recipe using fat-free cream cheese. With these substitutions, the modified samples fit the government standard for “reduced fat” and “low fat” products. Sensory evaluations were administered to untrained volunteer judges. Objective evaluations were measured using food sensory equipment in the university lab. The results of this study were that the modified cream cheese recipes were significantly different in all objective tests, including shear force, penetration force, and height. In the sensory evaluations, the cream cheese recipes were significantly different from the butter recipe in the lemon intensity and crunchiness tests, but not in sweetness and saltiness. The judges significantly preferred the low fat and reduced fat variations of the lemon cookies.

PSYLLIUM MIXTURE IS AN ACCEPTABLE GLUTEN-FREE SUBSTITUTE FOR ALL-PURPOSE FLOUR IN BANANA BREAD
Cummins, Mary; Benedicto, Mageline; Schlosser, Sarah
Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

This study was developed on the basis of creating an acceptable gluten-free flour substitute for celiac disease sufferers. Recent statistics show that celiac disease, gluten intolerance, has become the number one food intolerance around the world. Currently the only treatment for celiac disease is complete elimination of dietary sources of gluten. The study effectively replaced gluten containing flour with psyllium, while maintaining nutritional values, and creating an acceptable bread product. This experimental study included: accurate preparation, chemical composition analysis, sensory evaluation, objective evaluation and statistical analysis. The gluten free psyllium flour mixture contained psyllium, rice flour, potato starch, and corn starch. All characteristics except moistness, penetration force of the gluten-free recipe, and the peak compression force were found to be similar to the controls. The control recipe was found to have a slightly higher overall preference score than that of the gluten free version. Data obtained from sensory and objective testing indicates that psyllium makes an acceptable and affective gluten free bread product. In addition, fat and calorie content will remain approximately the same as in the control. Psyllium a readily, available and affordable fiber product has been found to improve cholesterol levels and gastrointestinal health.
FEMALE MATE CHOICE AND MEASURING MALE ATTRACTIVENESS IN THE FIELD CRICKET, 
**Gryllus firmus**
Curry, Megan; Buxel-Florenzen, Stefanie
Faculty Mentor(s): Lixing Sun, Biological Sciences

40 (Morning Poster Session in Ballroom)

Mate choice is a behavioral mechanism that is critical to the theory of intersexual selection first proposed by Charles Darwin. Empirically, mate choice is studied by using either concurrent two choice tests or no-choice tests. In the two choice tests, two males are presented simultaneously to a female. However, no-choice tests measure a female’s response latency of mating with a single male. Although recent studies tend to support the reliability of the second method, it nonetheless often artificially excludes the compounding effect of mate competition among males. Using the common field cricket, *Gryllus firmus*, our study was designed to compare the reliability of both methods as well as the interaction between mate choice and mate competition in the study of female choice. Additionally, we examined a male’s body size, antennae length and cerci length in relation to its attractiveness to females using correlation analyses.

CENTRAL THEATRE: AFTER SCHOOL
**Curtis, Zac; Curtis, Mindy**
Faculty Mentor(s): Scott Robinson, Theatre Arts

39 (Performance 3:40-5:20 in SURC Theatre)

Central Theatre: After School Mindy and Zac Curtis, MA Theatre Production candidates and former theatre teachers, are teaching two eight-week acting classes for Ellensburg youth. Although the classes are divided by age group, both classes use as their structure the basics of story, character, body, voice, and mind, rehearsal, and performance in order to teach the essentials of acting. The younger class, designed for youth grades 3-6, focuses on creating a devised theatrical work, allowing students to adapt, write, plan, and act their own short play. The older class, for teenagers grades 7-12, is focusing on the skills of improvisation. Both classes have a goal of teaching students the basics of theatre, especially acting, and allowing them to create their own work and demonstrate that work in a culminating performance in front of friends and family.

UNITED PIPE & SUPPLY
**Dahl, Alex; Stevens, Mark**
Faculty Mentor(s): Kun Liao, Finance & OSC

CWU-Lynnwood Poster Session

The project will discuss the continuous improvement and total quality management of United Pipe & Supply. The company is a wholesale distribution company for the Water Works, Turf, Pump, and Agricultural markets. It is a privately held company with revenues exceeding $100,000,000 annually. This project will be focusing on the continuous improvement for a segment of United Pipe & Supply’s Turf division. The project will focus on the manufacturing process of its computerized irrigation control systems. By incorporating the Six Sigma system popularized by General Electric’s Jack Welch, the poster will explore how operations can be improved on a variety of business activities. Quality assurance programs can create more efficiency and cost savings in the traditional areas of manufacturing, inspection, and distribution. Statistical analysis of data from the design to inspection process will be employed to create the smallest amount of defects possible, less than 3.4 out of 1,000,000. This low error rate ensures quality for all the products produced. However, Six Sigma can also be applied to broad aspects of a business from human resources to marketing and sales, and even in customer service. A total quality management system continually examines all operations to build the best organization possible. These processes can be used in the service industry as well. The analysis will show a real-world example of quality assurance systems can be work used in any small business.
Ellensburg, Kittitas County, and the greater Central Washington region in general have a rich and instructive history. Unfortunately, the public has little exposure to the area’s history. Some of the best research on the area has been conducted right here on campus in the CWU History departments Master's Program, but that research is buried in the library. What I have done is read a number of current and former graduate student’s theses, obtained photographs specific to their topics, and conducted interviews with them on their research, historical insights, and career paths. I not only hope to bring exposure to the history of the region but also to help benefit the CWU History department and their Masters program by providing additional exposure for students’ research. These articles and photos will be compiled into what will soon be placed onto a website. On top of helping out our students, I wish to help inform the people in the community on the wonderful history of the Central Washington area. I hope that this project will help give undergraduates at CWU a better idea of what they can do with their history degree. I also believe that it will serve as a recruiting tool in helping attract undergraduate history majors to the CWU M.A. program. In the future the website will offer graduate students a way to have their research more available to the public instead of only being available at the campus library.

**ASSESSMENT, ANALYSIS, AND SPATIAL CONNECTIONS: A CONFLICT SOLUTION MODEL FOR EFFECTIVE DECISION-MAKING IN NATURAL RESOURCE MANAGEMENT**

*Davidson, Charity*

Faculty Mentor(s): Anthony Gabriel, Resource Management

41 (Afternoon Poster Session in Ballroom)

Convening stakeholder groups to engage in the natural resource decision-making process is no longer just a trend of the 21st Century; it has become a primary component of implementing compliance measures born from a unique set of regulatory requirements. Under the assumption that conflict is inevitable at some scale, this poster presentation explores the creation of a conflict solution model known as the Assessment, Analysis, and Spatial Connections Model (AASCM). The AASCM was developed to provide a tool to improve the effectiveness of decision-making in natural resource management and combines an on-line, pre-assessment screening and analysis with a Geographic Information System (GIS). ASSCM creates and delivers an illustrative work plan for resource managers as a means to provide conflict solutions prior to assembling stakeholder groups associated with meeting regulatory obligations and includes a function for interim progress reports and updated work plans.

**DIET LEMON LIME SOFT DRINK AS A REPLACEMENT FOR EGGS, OIL, AND WATER IN A COMMERCIAL CAKE MIX MAY BE AN ACCEPTABLE REPLACEMENT**

*Davis, Kimberly; Baker, Priska*

Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

Today life is fast paced and many cakes are made from commercial box mixes. This study was performed in order to see if Funfetti cake mix could be prepared healthier and still be an acceptable product. The goal was to remove the cholesterol and reduce the calories by using diet lemon lime soda or egg whites and diet lemon lime soda instead of eggs, oil, and water. This was a controlled case study where participants were given samples in a closed booth and were asked to rate the products on their preference, moistness, chewiness, and sweetness. Two triangle tests were also preformed to see if subjects could identify the odd sample. In addition, two objective tests were performed. One on penetration force to look at tenderness and one on cake height. Analysis of Variance (ANOVA) and Tukey’s LSD test with a 5% level of probability were used to determine if there were any differences between variations. Anyone was able to participate in the study, unless they had some type of food allergy. This experiment used roughly 65 participants. We concluded that there are some differences in the control and the diet lemon lime soda version. However, most of the sensory tests showed no difference. Therefore, we concluded that diet lemon lime soda in Funfetti cake may be an acceptable substitute product. Overall we found that plain diet lemon lime soda and cake mix would be the best choice with fewer calories and no cholesterol.
GENDER REPRESENTATION: WOMEN IN INTERACTIVE ELECTRONIC ENTERTAINMENT

Davis, Monika
Faculty Mentor(s): Cynthia Coe, Women's Studies

19 (Oral Session 1:00-1:40 in 201)

In the world of popular interactive electronic entertainment, from computer, video and online games, women’s representation has been given a poor image and minimal opportunity. In regards to the beginning of video games, it is still debated in which female character was first to be introduced into the genre, but what seems to be even harder is being able to identify female characters in electronic games: from playable, story line, non-playable, to background. It has been speculated that the reason for these “mysterious” gaps of female depiction deals with gender stereotyping through the mass media, social spectrums and the games themselves. To find these hardly visible characters, we need to review what has been overlooked through a historical time line and how it relates to the representations seen today. There also needs to be consideration for possible solutions to this deficiency. It may be a small place to start, but electronic games have proven to be influential in many aspects of our society and culture, including education. Turning to a better representation of women can lead to greater experiences and a step towards a balanced direction for both genders.

NAFTA AND ITS EFFECTS ON THE ENFORCEMENT OF LAW AND INTERNATIONAL TRANSPORT AT THE U.S./MEXICO BORDER: A POLICY ANALYSIS

Davis, Perris
Faculty Mentor(s): Rex Wirth, Political Science

20 (Oral Session 12:00-1:40 in 202)

The North American Free Trade Agreement (or NAFTA) is a treaty that facilitates free trade between its signatory nations. The idea behind NAFTA, as it pertains to the U.S. and Mexico, is that with the elimination of trade barriers between the two nations (amongst other stipulations of the agreement), Mexico’s economy would benefit from increased trade with the U.S. and that the U.S. economy would benefit from cheaper imported products. As white market trade increased though, so did the ability of black market traders to trade across the border. The current and previous administrations have addressed this issue by proposing all kinds of high profile solutions to the problem; the hiring of more border guards, the acquisition of new equipment and a host of other solutions that can not address the problem. Since the ability to hide contraband increases with trade, additional spending will never be able to keep up. A solution to the problem might lie in fuller utilization of existing resources that are scattered out among law enforcement agencies at all levels and among all of the governments through whose jurisdictions NAFTA trade flows. A policy can not be based on an assumption. So, the first task of the research is to survey existing resources. If they prove adequate, alternative approaches to their deployment will be explored.
DUCTILE DEFORMATION PATTERNS IN THE LOWER PLATE OF THE NORTHERN SNAKE RANGE DETACHMENT: DEFORMATION TEMPERATURE, VORTICITY, QUARTZ C-AXIS FABRICS, AND FINITE STRAIN STUDIES

Dermond, Jeffrey
Faculty Mentor(s): Jeff Lee, Geological Sciences; Audrey Huerta, Other

1 (Oral Session 8:00-9:20 in 135)

The northern Snake Range detachment (NSRD), Nevada juxtaposes a hanging wall of unmetamorphosed rocks upon a footwall of ductilely thinned and stretched metamorphic rocks. Published work (Lee et al., 1987) suggests that lower plate rocks record dominantly pure shear and relatively low strains, well preserved in the northwest, overprinted by top-SE simple shear and very high strains, now well preserved in the southeast. To test this hypothesis, we combined deformation temperature, vorticity measurements, quartz c-axis data, and finite strain calculations for 20 samples spanning the northern Snake Range from the structurally highest quartzite in the footwall. From northwest to southeast, quartz and feldspar textures indicate a temperature range increasing from ~300º to ~450º C; vorticity measurements from rotated porphyroclasts indicate 71-64% pure shear decreasing to 60-57% pure shear; vorticity measurements from oblique quartz grain shape indicate nearly 100% pure shear decreasing to 27-16% pure shear; quartz c-axis fabric patterns transition from symmetric cross-girdle patterns to asymmetric top-SE single-girdle patterns; and finite strain ratios increase from 5.8 to ~100. A deformation history in the lower plate of the NSRD characterized by an initial phase of dominantly pure shear deformation superimposed on an eastward dipping sequence largely overprinted by a top-down to the SE simple shear concentrated to the southeast explains: (a) the increase in deformation temperature to the southeast, (b) pure shear deformation on the northwest that switches to simple shear on the southeast, and (c) an increase in finite strain northwest to southeast across the range.

CHICKEN NEURO EMBRYOLOGY: EFFECT OF CALCINEURIN ON AXON GROWTH

Dickerson, Andre; Godinez, Maria; Selski, Dan
Faculty Mentor(s): Daniel Selski, Biological Sciences

40 (Morning Poster Session in Ballroom)

The visual system is commonly used as a model for analyzing connections among developing neurons, the specialized cells that make up the nervous system. Neurons mainly consist of a cell body and an axon; in which the retinal tissue in the eye axons grow to the tectum, which is the part of the brain that receives visual information. Calcineurin is a protein phosphate and intracellular protein that plays a role in axon growth (Mulero et al. 2009). Fertilized chicken embryos are removed from the shell, placed in incubators to continue developing and treated with Tacrolimus (FK 506), a calcineurin inhibitor. These treatments are performed during the embryonic stages when the axons are growing from the retina to the tectum. Histological analysis to measure the thickness of the optic fiber layer (axon layer) within the retina and the tectum is conducted; comparing the thickness of the optic fiber layer between the FK 506 treated embryos and the control embryos. It is hypothesized that the optic fiber layer within the control embryo’s retina and tectum will be thicker than the FK 506 treated embryos due to the effects of the drugs. This is expected because previous work in this laboratory using similar analysis methods suggests that calcineurin inhibitors block axon growth.
Like the proverbial blind men touching an elephant, we all are constrained in our understanding of the world by our individual perspectives. None of us is able to personally perceive the entirety of the truth of any given situation, let alone the whole realm of reality. Rather we must rely on information gleaned from others to construct even a simple knowledge base. Descartes said that we should come to truth individually and through reason alone. Fortunately, this idea's dominance over the realm of philosophic inquiry has started to be broken in recent times. The pragmatists, for their part, have shown that Descartes' idea of getting to truth on one's own is entirely impossible. They contend that we need an equal playing field where everyone, consulting together in a democratic process, can present his or her understanding of truth. Then all ideas can be compared and synthesized to create a more complete picture of the actual truth. But feminist epistemologists point out that numerous social and political power structures work to suppress some people's idea such that the pragmatists' equal playing field can never be realized. I contend that Baha'i consultation provides an ethical framework in which responsible knowledge making, per the pragmatists' vision, can be realized.

**LOVELY LUCILLE: VINTAGE VISIONS**

*Dillion, Jamie*

*Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences*

**23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)**

*Lovely Lucille: Vintage Visions* is a fashion line inspired by the glamour of old Hollywood and the everyday life of a housewife in the 1950s. Named for my grandmother, who is 93 years old, the line strives to reflect grace, poise and vivaciousness. I was inspired by my grandmother, a mother of three and military wife, who had a passion for sewing and a love for her family. I also drew inspiration from the styles of Audrey Hepburn, Grace Kelly, Susan Hayward and Vivien Ley. The process of design began with studying the popular silhouettes, skirt and bodice styles, and fabrics used. From there, I sketched my designs, chose my fabrics, then began the draping and patterning process. The final product is a result of many hours of adjustments and refining and is a work I am truly proud of. This piece is one in a line of three garments; the entire line can be seen at the Fashion Merchandising spring fashion show, *Fashion Oddity*, May 22 at 7 p.m. in Milo Smith Theatre in McConnell Hall.

**FOSTERING A SENSE OF PLACE AT WALTER STROM MIDDLE SCHOOL: PROGRESS OF THE YAKIMA WATERS PROJECT IN THE CLE ELUM/ROSLYN SCHOOL DISTRICT**

*Dilworth, Erin; Browitt, Lisa; Griswold, Trish; Gabriel, Anthony; Cordner, David*

*Faculty Mentor(s): Anthony Gabriel, Geography*

**40 (Morning Poster Session in Ballroom)**

The Yakima WATERS (Watershed Activities to Enhance Research in Schools) Project at Central Washington University is an NSF funded program that aims to incorporate watershed science into the curriculum of rural schools within the Yakima River Basin. In the Cle Elum/Roslyn school district, Walter Strom Middle School (WSMS) is utilizing the WATERS program to enhance their objective of “Fostering a Stewardship of Place” within their students. Seventh and eighth grade students at WSMS have begun to complete this objective by first developing a sense of place, with the help of the WATERS program. These students have been focusing on the system closest to their campus, the Crystal Creek watershed. Through topographic mapping, watershed delineations, and stream table experiments, students have developed a sense of what and where the Crystal Creek watershed is, and how it was formed. The culminating activity aimed at cultivating a sense of place was a BioBlitz; a biological and cultural inventory of the Crystal Creek watershed. During this event, middle school students and faculty, CWU students and faculty, and community members surveyed land within the Crystal Creek watershed looking for everything from insects to cougar tracks to litter and historical artifacts. Results from the BioBlitz were added to an interactive map, created by the Geography Department's Center for Spatial Information. The map can be added to each year, and will allow for WSMS students to continue collecting and analyzing information about their watershed for years to come.
FOSTERING A SENSE OF PLACE AT WALTER STROM MIDDLE SCHOOL: SEVENTH GRADE OUTDOOR RESEARCH PROJECTS

Dilworth, Erin
Faculty Mentor(s): Anthony Gabriel, Geography

40 (Morning Poster Session in Ballroom)

In conjunction with the Cle Elum/Roslyn school district’s objective to foster a stewardship of place within their students, the seventh grade class at Walter Strom Middle School (WSMS) created local outdoor research projects. With the help of the CWU Yakima WATERS (Watershed Activities to Enhance Research in Schools) Project, a NSF program that pairs graduate students in the sciences with K-12 classrooms, the students aimed to answer questions about the physical and biological aspects of the nearby Crystal Creek watershed. Examples of research projects include observing moss growth, using quadrats to survey insect populations, precipitation rates over time, and wind speed measurements in different habitats. Students were able to gain experience with the scientific method through their research projects. Each research group developed a research question and hypothesis, outlined their methods, recorded data, and analyzed their results through discussion. Through these projects, students have gained valuable knowledge on the variation of physical and biological phenomena over time and space.

FOSTERING A SENSE OF PLACE AT WALTER STROM MIDDLE SCHOOL: EIGHTH GRADE SOCIAL SCIENCE RESEARCH PROJECTS

Dilworth, Erin
Faculty Mentor(s): Anthony Gabriel, Geography

40 (Morning Poster Session in Ballroom)

In conjunction with the Cle Elum/Roslyn school district’s objective to foster a stewardship of place within their students, the eighth grade class at Walter Strom Middle School (WSMS) designed social science research projects. With the help of the CWU Yakima WATERS (Watershed Activities to Enhance Research in Schools) Project, a NSF program that pairs graduate students in the sciences with K-12 classrooms, the students aimed to answer questions about the system that encompasses WSMS, the Yakima River watershed. These research projects focus on social, economic, cultural, and historical issues and topics within the watershed. The students also included a natural resource component in their research, as they have learned that one cannot separate humans from their environment. Examples of research projects in this class include comparing water use among different Native American tribes, the impact of coal mining on the economy and environment of Roslyn, and water quality measurements in Crystal Creek. These research projects expanded on the students’ experience with the scientific method in that they were required to look outside the box for their research topics. Students gained a new understanding for relating social and natural sciences, especially within the Yakima River watershed.

PERCEPTIONS OF COERCION

Dodgen, Lisa
Faculty Mentor(s): Danielle Polage, Psychology

41 (Afternoon Poster Session in Ballroom)

A confession has been viewed as the most influential type of evidence in criminal procedures, even more than eyewitness testimony and physical evidence in simulated juror studies. Contrary to the belief that people do not confess to crimes they did not commit, people are convicted, imprisoned, and sometimes put to death because of a false confession. Suspects in custody may waive their Miranda rights and put their innocence at risk by falsely confessing during an interrogation. Even though a wide range of interrogative tactics have been identified and used there is little evidence that shows which of them are effective in eliciting confessions from guilty suspects. The present study’s goal is to find out what tactics used to elicit a confession during police interviews are viewed as acceptable or unacceptable. The second goal of this study is to see if interview tactics are perceived as less coercive if they result in eliciting either a full or partial confession rather than less-desirable outcomes including the right to silence or denial. Participants will read a mock interrogation transcript and then rate the acceptability of 13 common police interrogation tactics (such as minimization, direct challenge, pointing out deception, etc.). Participants will read 1 of 4 versions of the mock transcript where only the final outcome of the interrogation is different (suspect confessed, made a partial admission, denied, or used their right to silence).
“A PICTURE IS WORTH A THOUSAND WORDS”— HIGHLY EFFECTIVE VISUAL AND LANGUAGE ARTS TEACHING APPROACHES
Donahoe, Susan; LaBrant, Natalia; Richter, Constance; Weller, Natalie
Department: Education

32 (Oral Session 3:40-5:40 in 135)

The saying, “A picture is worth 1000 words,” is true today. Educators use imagery for teaching core curriculum and standards for education in this state. Previously, informal research was done with 3rd, 4th, and 5th grade students to write better, but not approved by Human Subjects Committee. Simultaneously, a case study of 3rd grade twins was not approved. But in both, improved writing was consistent with preceding detailed drawings. But, would drawing would help teacher candidates write better? The Human Subjects Committee approved the use of EDLT 420, “Teaching the Language Arts (K-8)”, in an experimental model. Two randomly selected groups were given instructions, but the order of processes varied. One drew, then wrote; the other wrote, then drew. Three graders assessed writing: Dr. Libby Street, a graduate student, and Dr. Susan Donahoe. This research was reported at SOURCE two years ago. The prior images-making enhanced writing. Now, as teacher candidates work in K-8 schools, they observe practicing teachers combining writing and drawing. This study is descriptive, observational, documentary of the two processes in the literature and in practice, how the two are used in Washington state classrooms. A review of literature and anecdotal observations will accompany this presentation. The state requirements, Essential Academic Learning Requirements (EALRs) and Standard V, are matched with observed practice in K-8 settings with general conclusions. Incorporating drawing prior to writing narratives consistently is beneficial in the creative process and for meeting state standards for Elementary Education.

EXPLORING PATTERNS OF LIZARD DIVERSITY IN A TROPICAL DRY FOREST IN JALISCO, MEXICO
Donoso, Marina; Leeds, Austin
Faculty Mentor(s): Daniel Beck, Biological Sciences

40 (Morning Poster Session in Ballroom)

We investigated diversity and abundance of lizard species in a tropical dry forest in coastal Jalisco, Mexico. Tropical dry forests show strong seasonality in precipitation which creates a unique combination of drought-deciduous trees, tree-like cacti, and distinctive riparian plants. We studied lizards in two distinct habitat types -- upland and arroyo forests -- which show striking differences in vegetation. Upland habitats tend to have more deciduous trees (especially during the dry season) and arroyo habitats, which occur along temporary streams, have fewer deciduous trees and denser canopy cover. We conducted our study during late March 2010, near the peak of the dry season, by capturing lizards in pitfall traps setup along transects bisecting the two habitat types. We hypothesized that lizards would be more abundant, and show greater species diversity, in upland habitats where there is increased sunlight and availability of thermal micro-environments beneath the forest canopy. We found that lizard abundance and species diversity was lowest in arroyo habitats (2 species and 7 individuals), and highest in upland habitats (5 species and 16 individuals). Pitfall traps set up in intermediate habitats captured an intermediate number of both individuals and lizard species. These results are consistent with previous years’ findings despite uncharacteristic rainfall (the El Niño southern oscillation brought rare February precipitation to our study site) that reduced the canopy cover in upland habitats. However, we did find adults of some lizard species in our traps that would normally only be found during the summer wet season.
THE EFFECT OF PARTICIPATING IN AESTHETIC SPORTS ON MENSTRUAL HEALTH, EATING DISORDER RISK, CALORIC INTAKE, AND SELF ESTEEM
Douglass, Felicia; Layton, Amanda; Owens, Tristen
Faculty Mentor(s): Kelly Kerr, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

The emphasis on weight and appearance increases the risk for disordered eating and menstrual dysfunction in aesthetic athletes. Purpose: The purpose of this study was to examine the effects of participation in aesthetic sports (cheerleading and dance) on menstrual health, and the relationship between eating disorder risk, caloric intake, and self esteem. Methods: Collegiate dancers (n = 7), cheerleaders (n = 6), and recreationally active females (n = 7) were given a menstrual health questionnaire, a 24 hour diet recall, an EAT-26 survey, and the Rosenberg Self Esteem Scale. A Pearson’s r correlation was employed to examine the relationship between EAT-26 scores and caloric intake, and EAT-26 scores and self esteem. Results: 100% of cheerleaders were classified as eumenorrheic, 86% of dancers and recreationally active women were eumenorrheic and 14% were oligiomenorrheic. Cheerleaders scored highest on EAT-26 (20.66 ± 12.35), followed by dancers (10.29 ± 4.79) and recreationally active females (6.43 ± 3.55). Recreationally active females scored highest on the self esteem scale (24.71 ± 2.50), followed by dancers (21.71 ± 4.15) and cheerleaders (21.33 ± 4.71). A weak correlation was found between EAT-26 scores and caloric intake (dancers, r = -0.40; cheer, r = -0.47; rec, r = 0.32), while a stronger correlation was found between EAT-26 scores and self esteem for dancers (r = -0.90) and cheerleaders (r = -0.92). Discussion: The results suggested a low incidence of menstrual dysfunction and a weak correlation between EAT-26 and caloric intake among the cheerleaders and dancers in this study.

EFFECTS OF FUNCTIONAL FIBER ON POSTPRANDIAL GLUCOSE IN HEALTHY INDIVIDUALS MEASURED BY A CONTINUOUS GLUCOSE MONITORING SYSTEM
Dow, Shireen; Herrington, Stefanie; Pritchett, Kelly; Gee, David
Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Sciences; Susan Hawk, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

Diabetes in Americans is increasing at a rapid rate and is a major cause of morbidity. Consuming a low glycemic index diet (a diet that reduces the effects of carbohydrate on blood glucose levels) has been shown to reduce the risk of chronic diseases such as diabetes. Using fiber supplementation or consuming a high fiber diet to lower the glycemic effect of food may be beneficial for diabetics or those at risk for diabetes because of its potential to help control blood glucose. The effects of ultra high viscosity hydroxypropylmethylcellulose (UHV-HPMC) and psyllium fiber on postprandial glucose and second meal effects on 13 healthy active females were studied. In a single blind crossover design subjects were given standardized pre-measured breakfast and lunch meals in addition to 4g of each fiber supplement and a placebo. Blood glucose was measured by a continuous blood glucose monitoring system (DexCom Seven Plus, San Diego, CA). Preliminary results indicated that when the UHV-HPMC was consumed with the standard breakfast meal there was a significant (p<0.02) decrease in area under the curve when compared to the placebo. There were no significant effects in postprandial glucose concentration following the psyllium fiber treatment when compared to placebo. There were no significant differences on postprandial glucose concentration between either fiber supplements or placebo following the second meal. This study shows that the consumption of UHV-HPMC with a meal can blunt postprandial glucose.
THE SUBLIMITY OF ACHILLES: THE FAILURE OF SINGULAR SUBLIME FEELINGS
Downes, Phillip
Faculty Mentor(s): Matthew Altman, Douglas Honors College
19 (Oral Session 1:00-1:40 in 201)

This paper is an analysis of the tensions within Immanuel Kant's The Observations on the Feeling of the Beautiful and the Sublime. By addressing Kant's examples in literature, the tension between intentional use of singular feelings and unintentional emergence of heterogeneous feelings will be uncovered to understand the full implications of his pre-critical theory. The former feelings are simple responses to the object, like terror, and heterogeneous feelings are more complex feelings, like terror and magnificence. Achilles and other literary figures are caught in the middle of this tension by being viewed as singular by Kant and heterogeneous by others. This paper demonstrates that Kant's explanation of Achilles as simple is insufficient for understanding the complexities within this character.

IMPACT OF LARGE WOODY DEBRIS ON NITRIFICATION IN TANEUM CREEK, ELLENSBURG, WA
Duke, Paul
Faculty Mentor(s): Clay Arango, Biological Sciences; Paul James, Biological Sciences; Holly Pinkart, Biological Sciences
40 (Morning Poster Session in Ballroom)

It has become common practice to add large woody debris (LWD) to headwater streams in an effort to establish or restore spawning habitat for native fish populations. LWD increases habitat complexity, transient storage, and allochthonous material retention. Despite widespread stream restoration efforts using LWD, few people have studied how LWD influences stream ecosystem processes such as nitrification. Nutrient dynamics drive productivity in streams, therefore it is important to assess the ecosystem consequences of adding LWD during restoration. One of the most influential processes in nitrogen-limited streams is nitrification, or the oxidation of ammonium to nitrite via *Nitrosomonas* bacteria, and the subsequent oxidation of nitrite to nitrate via *Nitrobacter* bacteria. The mechanism driving this process is LWD increases transient storage which will increase ammonium, a molecule with high affinity for biotic sorption. When this ammonium is converted to nitrate it loses affinity for biotic sorption and is transported greater distances. I will identify how LWD impacts nitrification in Taneum creek by conducting short-term nutrient releases in a Before-After Control-Impact (BACI) statistical design. Measurements of ammonium, nitrate, phosphorous, chlorophyll, sediment respiration, whole-stream nitrification, and transient storage will be taken before and after LWD addition. Analysis of pre-addition data indicates a significant difference only in ammonium levels (Repeated Measures ANOVA, p<<0.001). This research supports restoration efforts by the Yakama Nation to increase salmon habitat through LWD addition and efforts in water quality assessment by the Washington Department of Ecology, who are concerned by high levels of nitrate in the Yakima River.

THE SCIENCE OF CLOTHING–WHY PEOPLE DRESS ACCORDING TO THEIR LIFESTYLE
Dyer, Carlie; Hahn, Whitney; Giannandrea, Ashley
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management
13 (Oral Session 9:30-10:50 in 301)

This research study entailed public observation of clothing design details, colors, fabrics and styles worn by individuals of varying demographics in the Ellensburg, Washington community. The purpose was to investigate apparel trends among different demographics and speculate if apparel was worn for function or fashion. The main hypothesis was that lifestyle characteristics among demographics influence style trends. Findings and their implications will be presented in this session.
APPLIED WATERSHED SCIENCE AT KIWANIS POND, YAKIMA, WASHINGTON MIDDLE SCHOOL

Eagleston, Holly; Lillquist, Karl; Quincy, Jackie
Faculty Mentor(s): Karl Lillquist, Resource Management

40 (Morning Poster Session in Ballroom)

The 7th grade class at Washington Middle School in Yakima, WA has taken part in Watershed Activities To Enhance Research in Schools (WATERS), a program that integrates interdisciplinary watershed research into public school curriculum. The main focus of the watershed research at Washington Middle School is exploring the ecology, pedology, meteorology and land use of Kiwanis Park. The park contains several softball fields, an open field, skate park and a pond. The class has collected data for each season looking at abundance and diversity of aquatic organisms, identifying soil type and soil erosion in the area as well as taking temperature measurements of different surfaces in the park and the pond. The Yakima Department of Parks and Recreation plans to fill the pond to make room for more softball fields. The class wrote letters to the environmental planner for the city to save the pond that has become the class’s outdoor laboratory. Currently, land use plans for the area have been changed to fill one end of the pond and put one softball field there. The class wants to do ecological restoration on the remaining part of the pond by evening out the lake margins to a gentle grade so the water table will be conducive to native vegetation such as bulrushes. In the future, students at the 7th grade level will conduct long term monitoring of Kiwanis Park.

REDUCING FEAR: TIPS FOR REDUCING APPREHENSION FROM AN APPREHENSIVE STUDENT’S POINT OF VIEW

Eglin, Alison; Wheeler, Caleb; Hall, Jessy; Hargrave, Elizabeth; Smith, Jinah; Wells, Sean
Faculty Mentor(s): Phil Backlund, Communication

15 (Oral Session 12:00-1:40 in 135)

Apprehension towards public speaking is a common obstacle for students and teacher alike in speech courses. Personal experience as well as a review of the literature on the topic has lead to the development of three recommendations for teachers of public speaking courses. Recommendations for reducing public speaking apprehension will focus on organization strategies, effective feedback, and classroom development. This workshop will provide attendees with unique tools that can be used to reduce the level of apprehension their students have toward public speaking.

POPRETRO

Eklund, Andrea
Department: Family & Consumer Sciences

23 (Fashion Show, noon, outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

Purpose: Inspiration for this garment came from the admiration of popular culture (and myself) with retro styles in apparel, home goods and novelty products and the 100th anniversary of when women in Washington permanently achieved the right to vote. The goal was to create a 1950s inspired garment and embellish the fabric with images found on ironic retro items. The final product illustrates the juxtaposition of classic styles, images and traditional women’s roles with the liberated ideals of today’s woman. Process: Researching for images was a large portion of the design process. I looked for specific images that embodied the iconic 1950s traditional housewife with the liberated and sarcastic ideas of today’s woman. Once the images were found, editing was performed to touch up the verbiage and images for best possible printing and transfer to the final fabric. Researching patterns from the 1940s and 1950s gave inspiration for the dress design. Techniques: The dress was creating through draping. Draping is the smoothing, contouring and manipulation of fabric on a dress form to create a garment or pattern. Images used were printed onto professional quality heat transfer paper and individually cut out. Over 250 images were arranged by size, color, and style and ironed onto the cut pattern pieces. The garment was then constructed and fully lined. Materials: 100% cotton plain weave fabric for dress and lining, professional heat transfer paper, invisible zipper, and thread.
DRIVING & AGGRESSION AMONG COLLEGE STUDENTS

Entz, Jessica
Faculty Mentor(s): Michael Harrod, Sociology

40 (Morning Poster Session in Ballroom)

Car accidents occur and because of it, lives are taken. Still, Americans choose to take part in the dangerous activity of texting while driving. Texting while driving is against the law in Washington State, and despite the fine, radio stations encourage listeners to call or text-in to their program. Among college students the trend does not disappear and is greatly accepted. Reactions to other drivers who are texting are ample reason to find out if men or women play an active role in aggressive behavior as a result of texting while driving. Students at Central Washington University were asked how they feel toward other drivers’ texting and how often they themselves take part in the activity. The results found that women tended to respond to texting drivers in a non-confrontational manner while men responded aggressively. As a result of this study, driver education classes should be mandated to cover texting specifically as it relates to the quality of driving and to the attention given by drivers.

A COMPARISON OF TWO WEB-BASED, BRIEF ALCOHOL INTERVENTIONS FOR FIRST YEAR STUDENTS

Farmer, Gail; Gabriel, Kara
Department: Wildcat Wellness Center and Psychology

41 (Afternoon Poster Session in Ballroom)

First year college students have been identified as a high-risk group for heavy drinking and associated consequences. Research indicates brief interventions combining cognitive behavioral skills, norms clarification, and motivation enhancement are effective in reducing drinking and related consequences among college students. Recent studies also indicate personalized feedback is effective whether delivered in-person, by mail or electronically. Although research supports the use of electronic feedback as a stand-alone strategy to reduce high-risk drinking in college students, few have examined implementing this type of program as part of a required first year seminar. Further, although available programs vary in terms of both length and cost, the literature provides little guidance in determining if more comprehensive programs are in fact more effective. Thus, the current study is aimed to address this gap by comparing two web-based alcohol intervention programs (Alcohol Wise and Electronic Check Up To Go) administered during first year orientation.

BATTLE OF THE SEXES: ACTUAL 3D OBJECTS IN A MENTAL ROTATION TASK REVEALS A PERFORMANCE INCREASE FOR BOTH SEXES

Felix, Michael
Faculty Mentor(s): Kara Gabriel, Psychology

24 (Oral Session 1:50-3:30 in 135)

Mental rotation tasks (MRT) have consistently demonstrated sex differences under a variety of testing conditions with males typically outperforming females. To date, such tasks use three dimensional (3D) objects presented in a two dimensional context (quasi 3D). The current experiment used quasi-3D and actual 3D objects in a novel task to determine if previously observed sex differences in MRT are an artifact of the quasi environment. Participants were forty male and forty female undergraduates who underwent training prior to a MRT that alternated between 3D and quasi 3D tasks. Results indicated a sex difference in both conditions however; both sexes displayed a higher performance ratio in the actual 3D environment than in the quasi-3D environment. In addition, a questionnaire assessing spatially related activities revealed that the amount of science and statistic courses taken, as well as frequent map usage, were directly related to MRT performance. These findings suggest that differences between performance on MRT’s may be due to differences in the interpretation of objects in quasi 3D and actual 3D contexts.
BLACK ALLEY
Flenniken, Arielle
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

The full length dress called Black Alley from my Aesthetic Collection will be featured in SOURCE. This item is an elegant, floor length dress showing an emphasis on pleats. It has a breezy sheer fabric with a silk lining. Its silhouette emphasizes a narrow waist and a long, thin figure. I was inspired by a variety of images showing classy women in beautiful, dark, elegant, fashionable, long gowns. I was also inspired by ruffles and pleats, which are shown in my design. My goal was to create a dress that the average woman would want to wear out on a special occasion. My overall theme for aesthetic collection is unsurpassed beauty. It is a unique feminine gown for the everyday woman. The design process was anything but simple. I began first by draping each individual piece on a body form. I then took each piece and made my own pattern. After making a pattern, I made a sample so that I could fit the design to my model, Allison. Next, I made any corrections to my pattern pieces and began constructing my final garment. This is one in a line of three garments; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in Milo Smith Theatre in McConnell Hall.

TO CORK OR NOT TO CORK?
Flowers, Traca; Milne, Jason; Castro, Raul
Faculty Mentor(s): James Bisgard, Mathematics

41 (Afternoon Poster Session in Ballroom)

Baseball is the great American past-time and the source of many questions. For example, does corking a bat create an unfair advantage or any advantage at all? A related question is what is the sweet spot of a bat? For our purposes, we define the sweet spot as the location on the bat that transfers the least vibration to the batter’s hands upon contact with the ball. A simplistic approach based on torque seems to imply that the sweet spot is at the end of the bat. With our definition of sweet spot, we find the sweet spot and discuss how different materials affect the sweet spot, as well as the effect of corking a baseball bat.

DI(2-ETHYLHEXYL) PHTHALATE (DEHP) AS A POTENTIAL INHIBITOR OF THE MITOCHONDRIAL ELECTRON TRANSPORT CHAIN
Fowler, Eric
Faculty Mentor(s): Carin Thomas, Chemistry

4 (Oral Session 8:00-9:20 in 140)

Next to Alzheimer’s disease, Parkinson’s Disease (PD) is the most common neurodegenerative disease, and one of the most common diseases in people over the age of 55. One of the pathways in which PD is thought to manifest itself is through death of dopaminergenic cells in the substantia nigra portion of the brain. One cause of cell death is oxidative stress from reactive oxygen species (ROS) generated by inhibited mitochondria. Although environmental contaminants such as pesticides are hypothesized to contribute to non-familial PD, plastics have not been thoroughly investigated. Di(2-ethylhexyl) phthalate (DEHP) is a plasticizer that is added to polyvinyl chloride and polyethylene plastics found in medical tubing and some food packaging material, and has been shown to leach from those plastics. The purpose of this study is to determine if DEHP inhibits mitochondrial NADH oxidase which is comprised of complexes I, III and IV of the mitochondrial electron transport chain. Such inhibition could elevate ROS production at complexes I and III, implicating plastics as one environmental factor that could contribute to the progression of PD. If plastics or plasticizers are found to inhibit mitochondrial function, the implications for the medical tubing and food packaging industry would be substantial.
CHEMICAL FLUORESCENCE
Frank, Michael; Gutierrez, Clara
Faculty Mentor(s): Timothy Sorey, Chemistry

40 (Morning Poster Session in Ballroom)

A chemical light stick’s primary light-producing compound is either a fluorescent dye such as a sensitizers or fluorophor. The reaction yields a product that when reacted with the fluorescent dye will absorb and then emit light at different wavelengths. Altering the reagents’ concentrations can change the speed of the reaction and the intensity of the light produced. If a calibration curve has been made, the original concentrations of the reagents can be determined using a spectrophotometer or similar instrument. The potential educational benefits from such labs are that they could provide students with an alternate way to determine concentrations using calibration curves and use the absorbance and transmission of products directly.

SHOPPING ALTERNATIVES: HOW ELLensburg CLOTHING RETAILERS ARE AFFECTED BY STUDENT BEHAVIORS
Frauen, Shiloh; Phipps, Erika; Smith, Ashley
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

13 (Oral Session 9:30-10:50 in 301)

This research study investigated the buying habits of female students on Central Washington University’s Ellensburg campus. Female students were surveyed on their shopping behaviors in Ellensburg. Local clothing retailers were also interviewed regarding their merchandising strategies. The hypothesis we tested was: The majority of female students shop online or in larger cities rather than shopping in Ellensburg. We also expected to find that shopping in Ellensburg is driven by impulse and is not a planned event for college females. Findings and their implications will be presented in this session.

CLOTHING AND CLASS RESTRICTION IN MEDIEVAL AND RENAISSANCE ENGLAND AS OBSERVED BY GEOFFREY CHAUCER AND WILLIAM SHAKESPEARE
Frauen, Shiloh
Faculty Mentor(s): Laila Abdalla, Douglas Honors College

34 (Oral Session 3:40-5:40 in 137B)

Class hierarchy ruled Medieval and Renaissance England and was highly visible through attire. Geoffrey Chaucer and William Shakespeare linked class oppression to their characters’ clothing to comment on the social upheaval of the lower class and reveal the false nature of the imposed aristocratic systems.

POUVOIR ROMANTIQUE
Frauen, Shiloh
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

The line, Pouvoir Romantique, embodies the transition from French Romanticism into Napoleonic rule. The soft lines of the silk dress are contrasted against the militaristic structure of the jacket. The pleated bodice is reminiscent of the French romantic style and is highly influenced by Delacroix’s painting Liberty Leading the People. This garment shows the dynamics of juxtaposing soft and hard lines, organic movement and structured detailing. The process of creating this garment included five initial sketches, draping the bodice, skirt and jacket, transferring the draped fabric to paper, and creating a rough sample of the garment, fitting the sample to the model, making the alterations to the pattern and then creating the finished garment shown at SOURCE. This garment is one in a line of three; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in Milo Smith Theatre in McConnell Hall.
USING INQUIRY TEACHING TO PROMOTE CRITICAL THINKING AND CONTENT KNOWLEDGE IN UNDERGRADUATE FUNDAMENTAL BIOLOGY

Gao, Miao
Faculty Mentor(s): Ian Quitadamo, Biological Sciences; Ralph Greenwald, Psychology; James DePaepe, Education

40 (Morning Poster Session in Ballroom)

Inquiry, as a set of processes and activities researchers engage in during investigative science, has become a national focus in science education. The role of inquiry in promoting key outcomes of higher education like the ability to think critically and improve scientific knowledge to make rational decisions in life is incompletely understood. Few studies show inquiry teaching helps students to develop science knowledge and thinking skill. The intent of this study was to investigate the extent to which inquiry implementation affects student critical thinking and content knowledge in undergraduate biology courses. Using the same instructor and case studies in both, critical thinking and content knowledge was compared between full inquiry (n=19) and partial inquiry (n=19) lab sections. Full inquiry students completed quarter-long group research projects, wrote collaboratively, and presented research posters, whereas partial inquiry students completed half quarter-long group projects and presented using PowerPoint. The NSF-funded Critical thinking Assessment Test (CAT) was used to measure critical thinking level at the beginning and end of the term. Content knowledge was assessed using three common course exams, including 2 midterms and a final. Results showed both full and partial inquiry teaching methods improved student critical thinking ability in only 9 weeks of biology coursework. No significant gains in content knowledge were show between exams 1 and 2 between both sections; however full inquiry students performed higher on the final exam than did partial inquiry students.

USING DATA MINING WITH JUVENILE ARREST RATE DATA

Gerstmann, Nathan
Faculty Mentor(s): Boris Kovalerchuk, Computer Science

5 (Oral Session 8:00-9:20 in 201)

Juvenile arrests are a common problem shared by all states in America, but analyzing the causes of juvenile crime is difficult and time consuming, since multiple causes can be involved. In an attempt to experiment with efficient ways of identifying and analyzing reasons for outbreaks in juvenile crimes, data mining techniques and Visual Data Mining (VDM) software is applied to analyze the juvenile arrest data. This work started with the collection of relevant and relatable data. Such collected data includes annual juvenile arrests per 1000 citizens and data pertaining to social and environmental influences such as poverty rate per county, number of citizens over the age of 18 versus under, and percent of citizens who rent, lease, or are homeless, etc. At this moment, the research was focused on data from Washington State counties and used multiple parameters for each county. Once the data was collected, it was converted into binary sequences, required by the Visual Data Mining software. The result was presented in visual MDF form that converts multidimensional data to 2-dimentional or 3-dimentional form that exploits colored bars that represent the chains of related cases. The study had shown that it is possible to organize and analyze the number of juvenile arrests against possible reasons for these outbreaks more efficiently using VDM software than on a traditional Excel sheet.

ANALYSIS OF DRAFT ORDINANCE RESIDENTIAL WIND ENERGY FOR ELLENSBURG

Ghazanfarpour, Haleh
Faculty Mentor(s): Rex Wirth, Political Science

41 (Afternoon Poster Session in Ballroom)

Current zoning ordinances in Ellensburg do not authorize installation of small scale wind turbines in the city limits. In 2009 Dr. Greg Brown presented a “draft ordinance” with 6 alternatives that would zone 48% of urban parcels for utilization of small scale wind turbines. That covers 2,412 out of 4,985 parcels. This presentation analyzes the different options addressed in the “draft ordinance”. The factors considered in the analysis are wind speed, power density, turbine output and tower height. Available wind data were used for estimating the maximum annual power output for each of the alternatives both separately and combined. The wind turbines matching the parcel sizes included 3 to 100 KW capacities. After incorporating the height factor into the analysis two of the options remained viable. These options were compared against annual electric consumption of the city in terms of city and federal targets for wind energy. The advantages, disadvantages and possible combinations of the two options are discussed in detail followed by recommendations.
USE OF HOLIDAY RELATED SIGNS BY A CROSS-FOSTERED CHIMPANZEE
Gibbons, Janie; Leake, Madeleine; Potosky, Robin
Faculty Mentor(s): Mary Lee Jensvold, Chimpanzee and Human Communication Institute

28 (Oral Session 1:50-3:30 in 201)

The Chimpanzee and Human Communication Institute in Ellensburg, WA is home to three chimpanzees, Tatu, Dar, and Loulis. The chimpanzees use American Sign Language in conversation with caregivers about daily routines, meals, activities, and celebrations. Holidays are regularly celebrated with the chimpanzees. The present study examined Tatu’s use of holiday-related signs by comparing the recorded signs in the week preceding a holiday with a randomly matched non-holiday week. The dataset for this study was a record of signs Tatu used each day from 1998 to 2008. Tatu used holiday-related signs significantly more during weeks before some holidays as compared with the non-holiday weeks. Throughout the chimpanzees’ life, researchers have provided interesting things for the chimpanzees to sign about both to enrich the chimpanzees’ lives and to encourage signing.

THE INFLUENCE OF AFFILIATIVE RELATIONS ON COPULATION BEHAVIORS OF TIBETAN MACAQUES (MACACA THIBETANA)
Ginn, Laura; Sheeran, Lori; Matheson, Megan; Li, Jinhua; Wagner, Steve
Faculty Mentor(s): Lori Sheeran, Anthropology and Museum Studies

36 (Oral Session 3:40-5:40 in 201)

The genus Macaca is the largest and most widely distributed primate genus, but M. thibetana remains understudied. Field research on this species has focused on dominance style, post-conflict behaviors, and the effects of eco-tourism, with limited research on sexual selection. As a sexually dimorphic species with linear hierarchies, rank is expected to play a role in mate choice; however, recent data suggest that rank is not correlated with mating. During August 2009, we examined affiliative behaviors of male-female dyads in a free-living group of Tibetan macaques at Mt. Huangshan, China to assess whether affiliative interactions influenced copulation patterns. We found that the proportion of time two individuals spent in proximity and grooming each other was significantly associated with cooperative copulations, particularly if affiliative behaviors occurred in the 24 hours before copulations. Our findings suggest that affiliative social interactions may be more important to Tibetan macaques’ mating outcomes than is rank.

ACTIONS AND STEPS TO RESOLVE A RISING VETERANS UNEMPLOYMENT RATE
Goehner, Chris
Faculty Mentor(s): Rex Wirth, Political Science

20 (Oral Session 12:00-1:40 in 202)

Service members now have to fight a new battle once out of the military lifestyle, finding a source of income. In one year, the veteran unemployment rate tripled and continues to stay well above the national unemployment rate. Efforts are being made to assist veterans to find employment, but are the results are not showing any signs of improvement? Having to overcome the obstacles of stigmas associated with combat related injuries, strict attention to detail and chances of returning deployments veterans have to overcome much more than the “traditional” unemployed American. Employers are intimated by this population and fearful of losing the veteran after they are trained to another deployment. Educational programs to assist employer is one possibility of increasing positive awareness of this population of unemployed Americans. Through this policy areas will be addressed of; free health care from already established federal programs, worker retraining, employer awareness of military job skills, and other programs currently in place but lacking a restructure for current returning veterans much more can be accomplished in improving the successful reintegration for all service members dealing with raising unemployment rates among this highly valued population.
SOCIALIZATION OF GUILT ANALYSIS
Gomez, Cornelio
Faculty Mentor(s): Eric Cheney, Sociology

7 (Oral Session 9:30-10:50 in 135)

Past research has been able to show the effects of socialization on individuals in their actions and opinions. The ability to assess guilt has been shown to be developed in an early age based upon the socialization process a child experiences through schooling and family life, especially as core concepts from their environment become internalized within the individual. This experiment tests 160 Central Washington University students from four different academic disciplines (Art, Economics, Sociology, Psychology) by having them read four Vignettes or short stories, each with gradually increasing levels of complex interaction by the characters. The students then rate each of the characters in the story based upon how guilty they feel the character is for the situation. This technique analysis how the socialization the student has been exposed to through their academic discipline has structured their views of guilt, and how their responses compare to other students in the same discipline as well as students in different disciplines.

CRIME PER CAPITA: WASHINGTON STATE COUNTIES INVESTIGATED
Goring, Kathleen
Faculty Mentor(s): Yvonne Chueh, Mathematics

41 (Afternoon Poster Session in Ballroom)

For my project, I plan to analyze crime data for counties in Washington State. I plan to investigate how total crime occurrences per capita of a county relate to population in that county. The data I will use to answer this question will be from Washington Associations of Sheriffs and Police Chiefs. I will run analysis on the data to determine if the data is normal and also use Analysis of Variance (ANOVA) to see if the mean crime rate per capita is equal or not between counties. My motivation for this project is that perhaps the conclusion of my analysis will influence where I reside permanently in Washington State.

AN ECOLOGICAL AND FUNCTIONAL ASSESSMENT OF DEPRESSIONAL WETLANDS IN THE QUINCY WILDLIFE MANAGEMENT AREA, GRANT COUNTY, WASHINGTON
Gray, Jeffrey
Faculty Mentor(s): Anthony Gabriel, Resource Management

41 (Afternoon Poster Session in Ballroom)

Formation of wetlands in the Columbia River Basin in central Washington has been controlled by its dynamic geological history and the advent of the Columbia Basin Irrigation Project (CBIP) in 1948. No studies have been conducted that compare the functions and characteristics of depressional wetlands that existed prior to the CBIP and those that formed after due to increases in regional water tables. Wetlands perform vital functions with regards to wildlife habitat, water quality, and hydrology. This study compares the ecological characteristics and functions of depressional wetlands in the Potholes Coulee located within the Quincy Wildlife Management Area (QWMA) in Washington State. Pre and post CBIP wetlands were identified using 1949, 1961, and 2006 aerial photographs in conjunction with National Wetland Inventory (NWI) maps. Using the Washington Department of Ecology's 2008 Wetland Rating Form for Eastern Washington, scores were determined for wildlife habitat functions, water quality functions, and hydrological functions, for 33 wetlands. Of the 33 total depressional wetlands surveyed, 17 formed before the CBIP and 16 formed after. Dominant vegetation communities, invasive plant species cover, hydric soil pH levels, and hydrological regimes were also recorded for comparison. Chi square and Krusal-Wallis statistical tests (p<0.05) are used to identify differences between wetland characteristics and the functions provided by the pre and post CBIP wetlands. Initial findings suggest that pre CBIP depressional wetlands outperform post CBIP depressional wetlands with regards to providing wildlife habitat, water quality services, and hydrology.
CREATING MATH E-BOOK FOR STUDENTS WITH DISABILITIES
Greear, Krista; Wahle, Ellora
Faculty Mentor(s): Ed Gellenbeck, Computer Science; Justyn Bell, Access Technology Resource Center

5 (Oral Session 8:00-9:20 in 201)

By state mandate, Central Washington University’s Center for Disability Services produces a variety of alternative format for students with disabilities. In particular, CWU students with print and reading disabilities often request computer-generated aural recordings (e-books) that we produce from their assigned textbooks. In this presentation, we report on our solution to the challenge of producing computer-generated e-books from dense mathematical content such as that found in math textbooks. This problem is technologically complex as few software work with a document markup language called LaTeX that formats the document in a way so it is easy to navigate. The process of creating computer-generated e-books is time consuming and extremely costly. The were several challenges we needed to overcome in order to successfully create a useable product read by a free Firefox plug in designed to for a variety of DAISY and electronic files. Scanning the math characters required manually inserting graphs, and tables. Transforming the scan into a useable document required English and math Optical Character Recognition software. The math OCR software did a initial recognition of the Math but further editing was required. We manually added complex math formulas and characters. The document with all the content then needed to be processed by the DAISY converter, an add-in in Word, in order for the document to be read by the computer. Tags were added to format the text so it is extremely navigable. Finally, the textbook needed to be easily accessible to the student.

PERCEPTION AND IDENTIFICATION OF ELLENSBURG BUSINESS LOGOS
Greenfield, Vanessa; Guild, Amy; Mackie, Sammy Jo
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

21 (Oral Session 12:00-1:40 in 301)

This research study investigated the decision making process of local business owners when choosing a logo design. We also researched consumers' awareness of the logos as a way to measure the effectiveness of the design in strengthening brand identity. Findings which will be presented include discussion of the retailers' logo development process, presentation of the official logos and consumers' perceptions of the logos.

SHAKESPEARE IN POPULAR CULTURE: TEACHING THE BARD AS A CULTURAL NECESSITY
Griffin, Pearl
Faculty Mentor(s): Laila Abdalla, Douglas Honors College; Gerald Stacy, English; Liahna Armstrong, English; Terry Martin, English

34 (Oral Session 3:40-5:40 in 137B)

Non-scholars often argue that Shakespeare’s work is archaic and that it is no longer relevant to modern lives, but even in today’s world, the Bard’s legacy lives on and continues to grow and permeate culture. A survey of incoming college freshmen uncovers that students recently out of high school recognize the words of Shakespeare, but are unaware that it is Shakespeare who wrote them. Through speaking to students’ existing experience with the Bard’s words, characters, and ideas, teachers can produce more sensitive, understanding, and mature learners. This presentation will discuss the relationship between Hamlet and Disney’s The Lion King, focusing particularly on the main characters’ indecision, followed by an analysis of how modern young people deal with grief and the specific strategies an English teacher can employ to provide her students with a more mature understanding of the basic human experiences found in the Bard’s plays.
THE FRESHMAN 15: IS CENTRAL WASHINGTON UNIVERSITY CONTRIBUTING TO AMERICA’S EVER GROWING WAISTLINE?

Groffman, Rebecca; Harrison, Andrea
Faculty Mentor(s): Rebecca Pearson, Nutrition, Exercise and Health Sciences

41 (Afternoon Poster Session in Ballroom)

With a growing understanding of the importance of healthy eating habits, this study investigated the eating habits of Central Washington University students. Participants (n=362) voluntarily completed an anonymous, Likert-scale survey in which they recalled their food choices, behaviors, and emotions surrounding healthy eating. Recent research has found that males tend to make less-healthy food choices. Using the literature as a context, the current study compared the differences between the diets of males and females and the effect of social determinants (location of residence, marital status, etc.) on their food choices. In addition, an open-ended question was included in the survey to allow respondents to identify and explain their emotions and physical feelings after making unhealthy food choices. Examination of the data revealed that, in contrast to prior research, males and females in our sample did not differ in their food choices. Additionally, although healthy eating is important to the majority of the college population, students may be unaware of the extent to which they consume non-nutrient dense foods during sedentary periods, such as watching television. However, research has found that oftentimes students choose foods of low nutrient density during these sedentary times. Low awareness of eating habits similar to that identified among Central Washington University students is not uncommon. When combined, unhealthy behavior choices, poor eating habits and lack of physical exercise may be contributing to the weight gain experienced by a large proportion of college students. Our research could help public health professionals improve nutrition programming for college students.

IDENTIFICATION OF THE NEURAL CIRCUITRY FOR ADAPTATION OF EGG-LAYING BEHAVIOR IN THE ROUNDWORM, C. ELEGANS, USING EGG-LAYING DEFECTIVE MUTANTS

Groves, Jennifer
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

40 (Morning Poster Session in Ballroom)

C. elegans, a small free-living soil roundworm, is used as a model for studying the neural basis of behavior. Serotonin (5-HT), released by the HSN neurons, stimulates egg laying through contraction of the vulva muscles. The VC neurons make connections to the HSN neurons and vulva muscles. C. elegans has been shown to adapt and withdraw to long-term 5-HT exposure. Adaptation is when the worms decrease their egg laying in response to 5-HT over time. Withdrawal is when the worms adapted to 5-HT produce a different response when removed from 5-HT, which is a decrease in egg laying. It is important to study the long-term effects of these responses because it gives us insight into how neuronal connections influence egg-laying behaviors. In order to study the circuitry for adaptation and withdrawal we examined egl-1, unc-42, and egl-1;unc-42 mutants. The egl-1 mutant was chosen because it results in loss of HSN neuron function. The unc-42 mutant was chosen because it results in loss of VC neuron function. The egl-1, unc-42, and egl-1;unc-42 mutant worms were placed onto 5-HT overnight, and then egg laying was measured for one hour with and without 5-HT, representing adaptation and withdrawal respectively. Both the egl-1 and unc-42 mutant worms were shown to exhibit adaption and withdrawal. The egl-1;unc-42 double mutant exhibited the same egg-laying behaviors as the egl-1 mutant worms, suggesting that the VC neurons act through the HSN neurons to cause egg laying. These results suggest that adaptation is occurring through the vulva muscles directly.
USING A CAMERA VISION SYSTEM TO CONTROL AN AUTONOMOUS VEHICLE
Grunwald, Corbin; Jones, Timothy
Faculty Mentor(s): Lad Holden, Industrial & Engineering Technology

The purpose of this robot is to use a camera vision system to locate and acquire a target ball and then kick the ball into a goal. A CMUCam2 vision system is used to find the ball or goals location in a 2D XY plane. The X coordinates are used to determine the location of the ball or goal in relation to the robot. The CMUCam2 then sends this data over a UART serial line to the PIC16F688 microcontroller which makes the decision on whether the robot needs to turn or drive forward to collect the ball, or to shoot the ball into the goal. The microcontroller is connected to two Parallax continuous rotation servos, and uses different frequency pulses to move the robot forwards, backwards, or turn.

BREAKING & ENTERING
Gunderson, Austin
Faculty Mentor(s): Michael Ogden, Communication

Breaking and Entering, A Short Film by Austin Gunderson. For a husband and wife, the bonds of love overcome differences—and dangers. CHARACTERS: The story involves four characters: Clance, Vera, Bob, and Joe. Clance is a man in his late twenties, husband to Vera. He’s a construction worker who hates his job but takes it seriously. His wife’s higher education unnerves him. Vera is a woman in her late twenties, wife to Clance. After a stressful workday, she wants to come home to companionship. Bob thinks he’s a genius. In reality, he’s a flamboyant high-school dropout who’s seen Ocean’s Eleven one too many times. Joe is a paranoid wreck on his first criminal escapade. PLOT SUMMARY: Clance arrives home from work and, as usual, ignores Vera’s silent bids for attention. Bob and Joe stealthily approach the couple’s house though the forest. They pause outside a back window and watch with amusement as an argument erupt between Clance and Vera, offering ironic commentary as the couple’s pent-up resentments come boiling to the surface. A choice between two outcomes seems inevitable. If Clance wins the argument, Vera will leave for her walk alone and fall into the would-be criminals’ clutches. If Vera wins, Clance will go with her and leave the house unprotected. Just as the tension climaxes, the two wake from their petty self-focus. They both apologize and decide to compromise with a game of chess. The burglar wannabes slink away into the darkness, foiled by the couple’s reconciliation.

EFFICIENCY OF A MODEL STIRLING ENGINE USING LIQUID NITROGEN
Hagemeier, Nathan
Faculty Mentor(s): Michael Braunstein, Physics

Can liquid nitrogen be used as an alternative form of fuel? We investigated the application of liquid nitrogen for energy storage. We did this by using a model Stirling engine to convert energy from a thermal reservoir into mechanical energy. Thermal reservoirs were either boiling water or liquid nitrogen in conjunction with ambient temperature. Data for this system was collected using a Vernier interface with temperature and photogate probes and analyzed for energy conversion efficiency. Applications of this could be in industrial power plants that store energy in liquid nitrogen during off peak hours, and use it as an energy supplement during peak power consumption.
During the summer of 2009 the National Science Foundation and Central Washington University sponsored research that I, as well as 11 other undergraduate students, participated in to examine how environmental degradation has impacted the social and economic structure of Northwest China. During our research in Qinghai and Gansu, China my colleagues and I conducted primary research in order to understand the best practices by farmers and peasants to handle water shortage, land deprivation and scarce resources. We conducted interviews with water bureaus, government figures, university professors and researchers, graduate students, factory owners but more importantly rural peasants, farmers, herders, and their families. We applied our observational skills at times that the government restricted us and attended lectures from our Chinese mentors, as well as translated literature and documents from libraries. Ultimately we wanted to answer three questions; how has the economic development from the Great Western Development Strategy affected water resource management in Northwest China, how have local users, largely rural, marginalized peasants, reacted to and employed their own creative strategies to reformulate central policy according to their own needs and what are the specific environmental impacts of rapid economic and infrastructure development? From our research in rural China we discovered that China’s state of water scarcity is a result of the exploitation of a common resource by individuals and industry that do not have invested ownership over their water.

This study investigated the effect of maternal stress levels on the attachment Q-scores between mothers and infants in habituated, free-living Tibetan macaques (Macaca thibetana). Thirteen mother infant dyads were observed at Mt. Huangshan, China, July-August 2009. All dyads were within the normal range of variation in maternal and infant behaviors. Subjects were assessed through continuous focal sampling and were measured for attachment using Q-sort methodology. Maternal stress levels were measured by self directed behaviors (SDBs) and correlated to dyads’ Q-sort scores. No significant correlation was found between Q-sort scores and levels of SDBs, and maternal rank, age, or parity (Pearson alpha =0.05, Spearman’s rho alpha=0.05). This study is unique in its attempt to measure attachment in a free-ranging population in their home environment. The results of the study may be due to the methodology employed, the small sample size, or they may reflect infants’ resilience in adapting to normal variations in maternal caretaking style.

Wide scale vaccination against the Swine Flu has consistently been the Public Policy response to potential pandemics. But the scientific evidence has not been there to back up such policy, and no objective picture has been developed as to the benefits and burdens vaccination presents. Consequently, in the past the tradeoffs associated with vaccination programs have proven unfavorable for the general public. Looking back over the nations’ three encounters with the Swine Flu (1918, 1976, and 2009) this analysis will draw lessons and generate alternatives based on past performance.
DARK LOYALTIES: A STUDY OF CHANGES OVER TIME IN SUBCULTURE IDENTIFICATION
Hanscom, Michael
Faculty Mentor(s): Robert Moore, Law & Justice

CWU-Des Moines Poster Session

The gothic community, while frequently viewed with distrust, has been a notable and vibrant subculture for nearly four decades. In recent years, though making inroads into popular culture through recurring characters on long-running television programs and the proliferation of retail stores such as “Hot Topic,” parents still tend to greet a child’s interest in the subculture with concern, often coupled with the hope that this will be “just a phase.” I wanted to examine the members of the Seattle gothic (or “seagoth”) community to determine how loyalty to the subculture varied with age. My hypothesis was that while there are some for whom the gothic identity is a phase, there are many others for whom it is simply another facet of their personality, and that for these individuals, identification with the subculture would strengthen with age. By posting an electronic online survey and relying on snowball sampling, I was able to survey over 120 members of the local gothic community. After stratifying the results by age, I ended up with results that did not support my initial hypothesis: the measured difference in subculture identification between age groups was statistically insignificant. However, I believe that improvements to the questionnaire would have produced a more measurable difference between the two groups. Nevertheless, this initial exploration of ingroup loyalty and identification within the gothic subculture leaves many possible further avenues of research open for exploration.

TO SAVE OR TO SPEND?
Harrison, Isa
Faculty Mentor(s): Rex Wirth, Political Science

20 (Oral Session 12:00-1:40 in 202)

The American Dream philosophy that is driving the United States further into debt is the same process that is causing us to degrade the quality of our environment. It is generally assumed that there is a strictly competitive relationship between our environment and our economy and that anything that helps the economy hurts the environment, or that, at best, there must always be a trade off of interests between the two. My thesis is that through better long-term business practices and personal choices we can help pull our economy out of its recession and help improve the quality of our environment. My paper discusses how citizens will have to change their ideas about the American Dream and how citizens will be able to improve the quality of our environment and the health of our economy through one single paradigm shift.

WOMEN IN SIR GAWAIN AND THE GREEN KNIGHT AND LANVAL: VOICING THE FEARS OF THE FALL OF ARTHUR AND HIS COURT
Hassouneh, Suhaila
Faculty Mentor(s): Laila Abdalla, English

27 (Oral Session 1:50-3:30 in 140)

In the two courtly love poems of Sir Gawain and the Green Knight (SGGK) and Lanval, the Pearl Poet and Marie de France show that Arthur’s court has fallen from its original stance of moral uprightness, knightly honor, and strong code of ethics. In both tales, Arthur’s court has been corrupted and needs to be corrected. However, before they can correct themselves, the Arthurian court must first become conscious of their corruption. It is only women who articulate the degenerate nature of men in Arthur’s court. According to Jerry Root, in Courtly Love and the Representation of Women, in courtly love traditions “[w]omen have the right and obligation to speak about their relation to men and to male property” (10). In SGGK, Gawain, through Morgan Le Fay’s tricks, learns about his own distortion and then transmits what he has learned so that Arthur and his court can supposedly come back to the right path. In Lanval, no man learns of his distortion, but women, who have the “right and obligation to speak,” express the cowardice and corruption that has befallen Arthur and his court. The women in SGGK and Lanval are tricksters who instigate the occasions that illustrate the corruption of Arthur’s fallen court, and also voice the perversion of Arthur and his court. Guinevere, Morgan le Fay, Lanval’s Lady, and Marie de France reveal the corruption of Camelot through the manipulation of judicial process and law, and through the effeminizing of Lanval, Arthur, and other court knights.
ANALYSIS OF AQUATIC INSECT COLONIZATION AND DRIFT CHARACTERISTICS ON THE WILSON CREEK RESTORATION PROJECT

Hatch, Kyle
Faculty Mentor(s): Clay Arango, Biological Sciences

16 (Oral Session 12:00-1:40 in 137A)

Wilson Creek is a relatively small creek system that runs naturally down from Table Mountain, and when it reaches the City of Ellensburg many portions of this stream are now urban. A 150 m portion of this urban stream has been restored on campus by diverting it into an engineered channel that includes large woody material (logs) and new habitat zones. After restoration, aquatic insects began colonizing the new channel, but the colonists drifted into the stream restoration from an underground culvert at the top of the research site. I studied how aquatic insects colonized the site by sampling and identifying insects from the stream bottom. I also sampled aquatic insects in the drift (i.e., suspended in the water column) to compare the insect community to the composition of the colonists in the drift. Lastly, I compared drift above and below the underground culvert to identify if the underground stream influenced the composition of the drift. The upstream drift density was 1.4 insects per cubic meter of water, and the downstream drift density mean was 0.64 insects per cubic meter of water. This difference was significantly different (paired t-test, p=0.02) indicating that the underground stream affected the abundance of insects in the drift. Upon completion, my analysis will define the successional trajectory of benthic insects, compare the benthic insect composition to drift composition, and will compare drift composition above and below the underground culvert to gain an understanding of insect colonization dynamics after restoration in an urban stream.

ALTITUDINAL VARIATION OF FREEZE TOLERANCE IN THE PACIFIC CHORUS FROG, PSEUDACRIS REGILLA

Healas, Sara
Faculty Mentor(s): Jason Irwin, Biological Sciences

33 (Oral Session 3:40-5:20 in 137A)

This study compares the physiological responses to freezing of Pacific Chorus Frogs from low-elevation and high-elevation sites. Pacific Chorus Frogs have an amazing ability to freeze solid during the winter months. They are able to do this because they store massive amounts of glycogen that they break into glucose. Glucose is used for (1) to protect the cells during freezing and (2) to support general metabolism throughout the entire winter. The hypothesis is that the frogs collected at the high-elevation site will have more glucose stored as glycogen because these frogs have to survive a longer, harsher winter than the frogs from lower elevations. We collected frogs in the spring from the Ellensburg area (low-elevation) and Swamp Lake (Snoqualmie Pass, high-elevation) and housed them outdoors until they had developed their cold tolerance in the fall. They were then moved inside to an incubator set at 2ºC. In January the frogs were frozen in a cooling bath down to -2.5ºC. Once frozen, the frogs were dissected and liver and thigh were extracted and frozen at -80ºC. Each tissue was later homogenized in acid and then neutralized with a base to extract the glucose and glycogen for measurement. The glucose and glycogen solutions are mixed with a color reagent which forms a colored product in the presence of glucose which is measured with a spectrophotometer. Results from this year’s experiments will be presented and next year’s goals will be outlined.
OBSERVATIONS OF SNOW PACK AT SNOQUALMIE PASS: A YAKIMA WATERS PROJECT AT
ELLENSBURG HIGH SCHOOL

Helland, Terry
Faculty Mentor(s): Tim Sorey, Chemistry

40 (Morning Poster Session in Ballroom)

9th grade students from Ellensburg High School conducted snow pack research at Snoqualmie Pass. The purpose of this study was to measure snow pack variability in the Yakima Watershed. Snow pack is an important resource for the success of agriculture, providing melt water for irrigation during the summer months. Estimations of the supply of water are provided by SNOTEL sites positioned in various locations around the watershed along with satellite data. Students also spent one day at the Washington Department of Transportation snow study plot at Snoqualmie Pass, where they dug snow pits and measured snow depth as well as snow density throughout the pit to calculate the Snow Water Equivalent (SWE). Their measurements will be compared with NASA modeled estimates of snow pack to improve the models in the future. Data collected was compared to that collected in prior years along with information from the SNOTEL sites to evaluate if the occurrence of an El Niño oscillation is linked to low snow pack in the watershed.

MEASURING PRECIPITATION IN THE KITTITAS VALLEY: A YAKIMA WATERS PROJECT AT
ELLENSBURG HIGH SCHOOL

Helland, Terry
Faculty Mentor(s): Tim Sorey, Chemistry

40 (Morning Poster Session in Ballroom)

Ninth grade students from Ellensburg High School conducted total precipitation (TP) research at EHS and around the Valley. Students were first given the task of creating a precipitation collection devices that would allow for accurate and precise measurement of both snow and rain fall. An emphasis was given to low cost design materials in an attempt to improve upon the perceived sustainability of the project. Due to lack of snowfall during the winter months very minimal data was collected on the ability to measure snow fall and snow water equivalence. Rain fall measurements from Bowers Field airport were used as the standard, and initial data suggest a strong correlation between their measurements and those made with the TP devices. With further improvements made to the device this small amount of deviation should be reduced further. Future studies will research the impact variation of location in the valley can have upon measurable precipitation.

A QUANTITATIVE LITERACY APPROACH TO ENERGY OF LIGHT LAB ACTIVITIES

Helland, Terry; Gatlabayan, Shawn; Gutierrez, Clara
Faculty Mentor(s): Tim Sorey, Chemistry; Yingbin Ge, Chemistry

40 (Morning Poster Session in Ballroom)

We propose that providing clear vocabulary, concept models/explanations and linkages between lab activities can improve student quantitative literacy. Early anecdotal evidence suggests students do not see a clear links to activities in the Energy of Light lab, but rather as distinct sections. Pre and Post lab quiz results suggest a development of misconceptions and lack of true understanding of concepts displayed through a reproduction of images lacking explanation. Future study will focus upon feedback from student assessment from implementation of the revised Energy of Light lab guide.
THE DENIM CONSUMER: FASHION OR CONVENIENCE?
Helms, Danielle; Smith, Kara; Rushton, Diana
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

30 (Oral Session 1:50-3:30 in 301)

This research project is a trend analysis of denim jean purchase and usage among Central Washington University students. A trend analysis is an attempt to spot a pattern in information and/or behavior. Presentation of the findings will include discussion of the most dominant and popular denim brand, comparison of retailer preference, and a discussion of the motivating features and benefits of denim jean products which persuade consumers to purchase including price, quality, style, retail location and brand name. The implications to local retailers will be presented. Findings and their implications will be presented in this session.

A COMPARISON OF TWO GLUCOSE MONITORING METHODS DURING SUBMAXIMAL EXERCISE
Herrington, Stefanie; Pritchett, Kelly; Dow, Shireen; Monosky, Keith; Gee, David
Faculty Mentor(s): Kelly Pritchett, Nutrition, Exercise, & Health Sciences

24 (Oral Session 1:50-3:30 in 135)

The absolute accuracy of Continuous Glucose Monitoring (CGM) systems, especially when glucose is changing rapidly remains debatable. Research regarding the use of a CGM during exercise is limited, while some researchers have used CGM as a valid measure to evaluate glucose profiles before and after exercise interventions. Continuous data from CGM can help in monitoring overall daily glycemia, however, the significance and reliability placed on acute readings from this device in a research lab remains questionable.

PURPOSE: The purpose of this study was to compare glucose values using a DexCom SEVENPLUS© (San Diego, CA) CGM system to capillary blood glucose (CBG) measurements during submaximal exercise.

METHODS: Twelve recreationally active females wore a CGM system for 6 to 7 continuous days. Two 45-min submaximal cycling tests (65% P_max) were performed on days two and four. Glucose measurements were taken every 5 min during exercise. A PowerBar gel supplement and 12oz of water were consumed 15 min into the cycling protocol. RESULTS: On average, the CGM system underestimated CBG (3.23±1.19 mg/dL). A Bland-Altman indicated a weak agreement (r=0.35) between the error (difference between CGM and CBG values) of glucose measurements. CONCLUSIONS: The results suggest that acute CGM values are not always accurate and substantial error between devices exists. However, the weak agreement between the errors of glucose measurements suggests CGM can be used in conjunction with other glucose monitoring methods.

USING IN SITU PLAGIOCLASE DATA TO DOCUMENT THE MAGMA PLUMBING DYNAMICS OF 1669 ERUPTION OF MT. ETNA, SICILY
Hess, Alex; Moses, Maureen
Faculty Mentor(s): Wendy Bohrson, Geological Sciences

41 (Afternoon Poster Session in Ballroom)

Mt Etna is one of the most active volcanoes on Earth. Since AD 1329, this basaltic volcano has had a well-documented eruptive history. Mt Etna has a complex subvolcanic plumbing system, which represents the area where magma is stored prior to an eruption (e.g., Moses, 2010; Viccaro, 2010). A common process that contributes to eruptions is magma recharge, which is when magma from a deeper source intrudes into a shallower chamber. During the 1669 eruption, which represents one of the largest recharge events, recharge magma had a higher MgO content and was less dense than residing magma. This resulted in relatively quick ascent through the residing magma. Recharge magma erupted first, followed by residing magma; little mixing of the two magmas is hypothesized (Corsaro et al., 1996). This hypothesis predicts that recharge magma will have different compositional characteristics from the residing magma. The goal of this project is to compare plagioclase (Ca-Na silicate) crystal signatures from recharge and residing magmas to document similarities and differences. Using the electron microprobe and laser-ablation technology, plagioclase crystals will be analyzed from core to rim for Ca/(Ca+Na) and Sr isotopes. If the residing and recharge magmas have different plagioclase groupings, this supports the rapid ascent model. If not, as supported by preliminary data, then the magmas may have mixed more than hypothesized. Eruption and mixing dynamics are important because they provide key information about how quickly magma may ascend and erupt, which, in turn, helps improve volcano hazard mitigation.
DESIGN, IMPLEMENT, AND TEST A CONTROL-SYSTEM FOR A SCANNING TUNNELING MICROSCOPE USING LABVIEW
Hobbs, Christopher
Faculty Mentor(s): Lad Holden, Industrial & Engineering Technology

11 (Oral Session 9:30-10:50 in 201)

Using the LabVIEW development environment I will develop the control system needed to operate a scanning tunneling microscope to achieve near atomic level microscopy of the surface of highly ordered pyrolytic graphite (HOPG). The LabVIEW software will control the x, y, and z movements of the piezo-electric tube holding a platinum/iridium tip to scan the surface structure of the HOPG. The tunneling current from the surface to the tip will be measured using LabVIEW hardware and the LabVIEW program will adjust the z movement depending on this current. This z movement will then be recorded in a computer file and displayed to a 3D imaging system for further analysis.

HELLS CANYON SETTLEMENT PATTERNS: GIS MODELS OF ARCHAEOLOGICAL LANDSCAPES
Hocking, Sara
Faculty Mentor(s): Steven Hackenberger, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

This study addresses winter settlement habitation in Hells Canyon through cost surface analysis. Specifically, predicting the size and shape of areas which can be reached within specified travel distances over different terrain types. GIS analysis comprises of a cost surface analysis of four concentrated house settlements within Hells Canyon to determine size and shape of catchments within four hours of travel. This analysis uses GIS to determine the location of storage caches in relation to village sites. The predicted findings are: 1) areas with larger inter-canyon areas were more heavily settled; 2) house settlements are placed on the east or west side of the river so that the greatest area of open canyon will be on the same side of the river as the settlement, and 3), storage caches will be located on the margins and downstream from settlement locations. This research can be used to create a model that determines with high probability potential locations of a prehistoric villages or storage cachements on the landscape with extra consideration given to possible autocorrelations of locations with other factors, specifically, river gradient.

THE LIVING MASK: SIMULATING SOUTH AFRICAN SCARIFICATION WITH MAKEUP
Hodge, Ashlen
Faculty Mentor(s): Scott Robinson, Theatre Arts; M. Catherine McMillen, Theatre Arts

41 (Afternoon Poster Session in Ballroom)

In theatre, the process of creating a believable character goes through several persons: the director, actor, and costumer. Makeup design is part of costuming, and it has the power to completely alter one human being into another. I wanted to create a character that would exist in the real world but would be outside my ideas of “normal.” I decided to mimic scarification as it is used in South Africa using liquid latex and shadowing and highlights. Scarification is the process of cutting, etching, or burning into the skin some design, which can contain symbols that relay meanings about the person i.e. strength as a mate and tribal affiliation. I took inspiration from several tribes, my main source being the bovine respecting Nuer tribe in Ethiopia. What I discovered was how malleable human features are and that conceptualizing the human face as a living mask, rather than having a certain type of face to play a specific role, the pallet can be morphed through simple makeup illusions into anything the director or designer could dream up.
DETECTION OF SNOW AVALANCHES USING SEISMIC TECHNIQUES AND METEOROLOGICAL DATA, ROCK FACE SITE, SNOQUALMIE PASS, WASHINGTON

Hogan, Eliya; Woods, Brad
Faculty Mentor(s): Charles Rubin, Geological Sciences

41 (Afternoon Poster Session in Ballroom)

Snow avalanches are a significant natural hazard in many mountainous regions of the world. However, the ability to predict their onset and to mitigate risk arising from snow avalanches is limited due to an incomplete understanding of snow-avalanche processes. The high rate of avalanche activity at Snoqualmie Pass, Washington provides an exceptional opportunity to characterize avalanche processes. These natural avalanches result from rapidly rising temperatures, rain-on-snow events, and/or rapid loading of storm snow. Since avalanches are difficult to forecast, they threaten the safety of travelers, damage property and close roads for extended periods of time. While mitigation efforts are mostly successful along Interstate-90 corridor, Snoqualmie Pass, backcountry recreational areas do not have the benefit of avalanche mitigation systems. The objectives of our study are to determine the timing and frequency of natural snow avalanches using seismic and meteorological data. We present preliminary seismic and meteorological data from the Rock Face site, Alpental Ski area, near Snoqualmie Pass, Washington. The Rock Face site is an excellent location to document the onset of snow avalanches using seismic techniques because it experiences frequent snow avalanches. Our data show a possible correlation between snow and air temperature with avalanche activity. In addition, changes in the height of snowpack suggest rapid settlement of the snowpack might correlate with an increase of snow avalanches. Our results will potentially lead to a better characterization of avalanche processes that influence the onset and release of avalanches.

COSTUME DESIGN FOR SHAKESPEARE’S THE TEMPEST

Holmes, Amy
Faculty Mentor(s): Scott Robinson, Theatre Arts

41 (Afternoon Poster Session in Ballroom)

My design I would like to submit is a final costume design for The Tempest by William Shakespeare. This was a final assignment for Theatre Costume Design and shows the design process with research, concept board, concept statement, play and character analysis, character and costume plots, and rough and final renderings. A unique take to the design was to create something for a non-western culture, and so I chose Thailand.

BLUSTER

House, Alicia
Faculty Mentor(s): Therese Young, Nutrition, Exercise and Health Sciences

31 (Performance 1:50-2:30 in SURC Theatre)

Bluster originated in my choreography class, taught by Therese Young. Our final project was to develop a piece of choreography through an integrated arts approach. To begin we were instructed to find a poem that sparked our interest, and then a piece of artwork that represented our thoughts about the poem. The motifs from these sources would be the inspiration for our choreography. The poem that I chose was Wind on the Hill, by A.A. Milne. The artwork that I felt correlated to the poem was named Rhapsody II, by Elizabeth Otto, who was a featured artist at the Central women’s art show several months ago. The painting is a collage of swirling wind and music—a perfect match to the poem. The next phase in the project was to find the appropriate music to bring the images and movement together. The song I decided on was a remake of the song Meant to Live by Switchfoot, redone by Vitamin String Quartet. Once I had the music and the thought of wind in the back of my mind the choreography quickly evolved. Ballet and lyrical, the two types of dance that come naturally to me, were perfect to portray the image of wind through movement. For inspiration, I simply looked outside at the seemingly never-ending bluster that Ellensburg has, and noticed beautiful random patterns of swirls and gravity defying leaves floating about. I tried to capture and replicate that effect in my dancing by stretching both my body and mind.
SOLUTIONS FOR RATING WINE FAULTS

Hudelson, John
Department: Family & Consumer Sciences

30 (Oral Session 1:50-3:30 in 301)

Most organoleptic evaluation of bottled wines is done by judges who rate their attributes and overall quality against one another or against a standard. CWU's Quality Wine Initiative (QWI) is a reverse rating system, awarding a high numerical value to the more faulty a wine is. QWI is one of the most comprehensive evaluations in terms of types of faults found in wine. However, the study resulted in methodological problems that required novel solutions, which this paper is a presents. Colloquially speaking, a wine that has an atypical flavor is said to be flawed and a wine that is undrinkable because of a flaw, is designated faulty. A numerical rating system of 0= "no fault," to 5= "very faulty" in five categories of faults resulted in some faulty wines being categorized as "acceptable" and others with only slight flaws as being "faulty" no matter what cutoff threshold was employed. The solution to the problem was to assign a power-of-2 to each of the judges numerical rating of a fault and thereby increasing the effect of the fault at each consecutive level: a slight fault of “1” would be valued at “1” but a rating of “3” would be valued at “9,” and so on. We could then assign what would be a threshold for a faulty wine at “10” (given we were measuring only a total of 5 faults). The process that I devised is a mere footnote to the research but will be noted in publications.

AN ANALYSIS OF A CHAOTIC THIRD ORDER DIFFERENTIAL EQUATION

Hudson, Chris
Faculty Mentor(s): Michael Braunstein, Physics

2 (Oral Session 8:00-9:20 in 137A)

We are numerically investigating the properties of the equation \(x''' = Ax'' - x' - x + 2\tanh(x)\). This equation was identified by J.C. Sprott as behaving chaotically and it can be simply implemented with an electronic circuit (Sprott, 2000). Using Mathematica 7, we have modeled the time evolution and phase space while varying the control parameter \(A\) to characterize the attractor. These models are being used to evaluate the Feigenbaum constant and the Lyapunov exponent spectrum for this system. Sprott, J.C. (2000). Simple chaotic systems and circuits. American Journal of Physics, 68(8), 758-763.

DREAM FRONT

Huerta, Leonard Allen
Faculty Mentor(s): Michael Ogden, Communication

14 (Performance 9:30-10:50 in SURC Theatre)

Dream Front Characters: Jackson, Senior mortgage officer who has lost all passion for his work. Bradlington, Senior Mortgage Officer. In position not due to his experience with the company but because he is one of the head bosses children. Everything is a joke or a game to him. Dr. Turner, very professional and intuitive. Well composed and not easily riled. Valerie Boss of NEP Mortgage, very aggressive yet sinfully seductive. Jeanine Secretary at NEP Mortgage, incompetent, airhead. Knows nothing about the company or really even her job. Plot Summary - Jackson, a senior mortgage officer who has lost all passion for his work, finds his life being troubled by a recurring dream. He watches the woman he loves die time and time again and has no way of saving her. After months of this vision, Jackson takes a friends advice and begins to see a psychiatrist. As the dreams vanish and his life begins coming back together, it all begins to fall out of place. The events that he was forced to live through time and time again come to reality and he is forced to make the decision he could not make in his dreams. Though, by saving her life, he puts his own in danger.
China’s Northwest has historically existed as a unique borderland where various ethnic groups have lived in a relative economic symbiosis engaging in trade, commerce, and cultural exchange. The nature of the economic interactions, to a large degree were shaped by the landscape of Qinghai province; it has produced two distinct patterns of subsistence in this particular region, that of agriculture and that of pastoralism. Over the course of the twentieth century, however, this region has undergone significant transformation as a result of the advent of an agriculturalism which has changed not only the topography of the Northwest, but has affected the relationships among traditionally herding and agricultural communities. Chinese policies have historically favored agriculture, and have recently adopted particularly aggressive policies toward increasing food supplies, grain yield, and land cultivation under the People’s Republic of China. Water resource projects are, quite understandably, seen in a very positive light by the Chinese government as a physical demonstration of China’s increasing success in infrastructure development. Nonetheless, our research has revealed that this development has been accompanied by several important ethnic and environmental issues that merit attention at the national level. The encouragement of agriculture has decreased trading between Salar Muslims and Tibetans, furthering the economic divide between the two groups, and contributing to increased water use and detrimental agricultural practices. We contend that the construction of these water projects disregarded Qinghai’s ecological limits and continues to negatively impact the balance between nomadic people and agriculturalists.

This year, I was awarded the privilege to perform Quatre Variationes sur un Theme de Domenico Scarlatti, by Marcel Bitsch, at the semi-final round of the National Trumpet Competition in Washington DC. The event only allowed around 40 undergraduate students to compete out of the 140 applicants for the division. The competition had applicants from across the nation including schools such as Juilliard, University of North Texas, Manhattan School of Music, Indiana University, and Eastman School of Music. Preparation for the competition took months. The process began spring quarter of 2009 learning the piece. This was in preparation for the initial stage of the audition process, which was a recorded audition due in mid-December of last year. After finding out in January that I had been accepted, my efforts were redoubled for the final stretch to the trip to Washington DC in early March. Countless hours were spent learning to play the seven minute piece to the best of my ability. The competition was an eye opening experience to the high level of musical ability across the country, but it also speaks favorably of the incredible level of the Central Washington University Music Department.
MARRIAGE AND EQUALITY IN CHAUCER’S WIFE OF BATH

Huss, Kathryn
Faculty Mentor(s): Laila Abdalla, English

27 (Oral Session 1:50-3:30 in 140)

Like the young knight in the *Wife of Bath*’s prologue, many men in the medieval period treated women as inferior creatures that needed to be controlled. The portrayal of women at the time justified their treatment, as they were often portrayed as animalistic, foolish, and uncontrollable monsters. While Chaucer portrays the Wife of Bath somewhat in this way, he does so to defend women and make a statement about the social norms of the time. Chaucer uses Alison of Bath to demonstrate that the common practice of treating women as though they are inferior is wrong, and, if anything, men and women should be more equal. The *Wife of Bath* demonstrates this idea in her prologue and tale: in order for any marriage to be a happy one, there must be some degree of agreement. Both Alison of Bath and the young knight in her tale experience life-changing relationships that cause them to alter their behavior from dominating into more supportive.

A CHARCOAL HEART

Iiyama, Brian
Faculty Mentor(s): Michael Ogden, Communication

14 (Performance 9:30-10:50 in SURC Theatre)

My SOURCE project is a 30-minute horror film that I have written, produced and directed. The project is called *A Charcoal Heart*, a horror thriller that takes an old fashion prison break and sets it in a modern, grizzly horror environment with the theme of “beauty wants nothing to do with the beast.” We follow our main character, Mary, as she attempts to bust out of an inescapable prison overseen by a tragic and malevolent force, the monster Samuel, while interacting with a mysterious dog that appears in the room. The main character is Mary, a strong willed woman who is caught in a room where dirt hugs sunken windows, roots reach down from the ceiling, boxes simulate mock sun light and the doors do not open. She goes about creating a means of escaping this prison while she interacts with a belligerent reappearing dog and the ominous force that keeps her there. The villain is the enigmatic monster Samuel, a ravenous creature whose intentions may not be as they seem. He toys with Mary throughout, assuming that she is far weaker than she really is. The dog is a wily and hyperactive animal who begs for attention when he appears. He plays a little too aggressively, but his presence puts Mary at ease in this foreboding environment. The dog played himself as the role, and was not abused or physically forced to do anything he did not want to do.

CENTRAL WASHINGTON UNIVERSITY’S GRADUATION PROCESS

Ingersol, Daniel; Lass, Brain; Melton, Jason; Hung, Ma
Faculty Mentor(s): Kun Liao, Finance & OSC

CWU-Lynnwood Poster Session

As spring approaches, the excitement of graduation and commencement comes with it. Students across the nation are preparing resumes, finishing up final classes in preparation for the next phase of life. Central Washington University is no different from any other college or university in the nation. Unfortunately, with the distance between the main campus in Ellensburg and the satellite campuses on the west side, the process of applying and the steps that need to be taken are more difficult than they need to be. The current process at the satellite campuses is to submit your paper application and payment to the local administration office who will confirm payment has been received and then mail the application to Ellensburg for further processing. Once received in Ellensburg, administrative personnel input the data and verify the person is eligible to graduate. Additionally, once the student submits their application, no information is provided by the school to guide us on what the students should be doing. As stated above, the process could be much easier. Having students to fill out and submit their applications on the internet via safari, and charging their accounts for the graduation fee would have a significant impact on the overall process. Next, making the guidelines easier to find so students have a checklist or “To Do” list to keep them on track would make it easier for students and the school to have a successful commencement ceremony.
USING HATHA YOGA IN COUNSELING
Ingram, Christina; Brammer, Robyn
Faculty Mentor(s): Robyn Brammer, Psychology

41 (Afternoon Poster Session in Ballroom)

American and European mindfulness exercises have entered into mainstream counseling theories and technique classes. Many of these techniques have their roots in ancient Yoga practices, but few practitioners understand the links between these disciplines. This study addresses ways in which counseling practitioners can implement simple techniques of Yoga into their client’s treatment plans. We begin by considering the history of Yoga and the similarities/differences between contemporary counseling and ancient Yoga. Research on the physical and psychological benefits of Yoga are provided (e.g., reduced anxiety, improved healing after surgery, better balance, improved self-regulation, and increased longevity). Essentially, Yoga works by uniting breathing with action. With this in mind, the goal is to help people control their breathing, even when their body enters a state of mild stress. Therefore, mindfulness and breathing techniques will be discussed within the role of Yoga in regulating negative thinking and anxiety.

SEX DIFFERENCES IN FREEZE TOLERANCE AND CRYOPROTECTANT MOBILIZATION OF SPRING PEEPERS (PSEUDACRIS CRUCIFER) AND WESTERN CHORUS FROGS (P. TRISERIATA)
Irwin, Jason; Finkler, Michael
Department: Biological Sciences

33 (Oral Session 3:40-5:20 in 137A)

Several species of temperate hylid frogs (treefrogs) are freeze tolerant, surviving the conversion of most of their body water to extracellular ice as they overwinter in terrestrial sites within the frost zone. Survival of freezing is largely due to the cryoprotective effects of glucose, which is rapidly produced from large glycogen reserves in the liver when freezing starts. Females use a large amount of energy to produce eggs and, therefore, have significantly less glycogen stored in the liver than males. Because females have less glycogen, we hypothesized that females would produce less glucose upon freezing and, therefore, be less tolerant of freezing than males. After collection in late March, Spring Peepers (Pseudacris crucifer) or Western Chorus Frogs (P. triseriata) survived freezing to -2.5°C and below. Females of both species had liver glycogen contents only 25-30% of that of males. With less glycogen available, females produced about 50% less liver glucose than males. However, despite producing less glucose, the female frogs survived freezing just as well as the male frogs. Our results suggest that the amount of glucose produced during freezing may not be the factor limiting how much freezing is tolerated, as other studies have suggested.

THE TEMPEST: COSTUME DESIGN BY BRIAN JOHNSON
Johnson, Brian
Faculty Mentor(s): Scott Robinson, Theatre Arts

41 (Afternoon Poster Session in Ballroom)

I took the average drama The Tempest by William Shakespeare, and altered the island on which Prospero and Miranda were banished to by the king of Naples, Alosno, to an Aztec inspired island. And all the Naples men are from Italy in the Elizabethan era. My research involved alot of looking at how the societies cultivated themselves, and their different beliefs on gods and goddess. Along with the different fashions of clothing and how much or little they wore. and really implementing clothing that held the Italian look but resembled an Aztec feel to them.
BURIED IN BEAUTY: SEEKING LOLITA IN TEXT, IMAGES, AND INTERPRETATION

Johnson, Joseph
Faculty Mentor(s): Steve Olson, English

35 (Oral Session 3:40-5:40 in 140)

“Buried in Beauty: Seeking Lolita in Text, Images, and Interpretation” examines Vladimir Nabokov’s most popular work, *Lolita*, and the pervasive misrepresentation of the title character within both the novel and its subsequent adaptations. In the novel, Humbert Humbert, Nabokov’s narrator and protagonist, describes Lolita as a willing partner in his sexual relationship with her. However, this essay argues that Humbert’s descriptions, when juxtaposed with clues from the novel’s narrative, suggest that Humbert is an unreliable chronicler of his lover-stepdaughter. As such, Humbert not only abuses the young girl sexually, he further violates her by distorting her actions to serve his purposes. Humbert’s abuse of Lolita is not surprising, given his motivations, need for self-justification, and degree of self-delusion. However, subsequent interpreters of the novel have compounded the abuse of Lolita through a continued process of misrepresentation. Considering the three subsequent film adaptations—Nabokov’s screenplay, Stanley Kubrick’s 1962 film, and Adrian Lyne’s 1997 film—this essay argues that Lolita is consistently exploited by her literary and cinematic “biographers.” Her interpreters compound Humbert Humbert’s abuse by further abducting Lolita and repeatedly misrepresenting her for their own purposes.

HOLLYWOOD FILM ACTOR NETWORKS

Johnson, Daniel
Faculty Mentor(s): Eric Cheney, Sociology

7 (Oral Session 9:30-10:50 in 135)

This study examines the social network of Hollywood film actors and their roles in the American film industry. The Internet Movie Data Base (IMDb) lists every Hollywood film production along with its cast of actors. All American feature films produced between the years 2000 and 2005 are sampled to construct a sociomatrix of who worked with whom during this period. Standard network analysis techniques are used to analyze the overall sociometric properties of the network along with the relational properties of the actors. These methods reveal which actors are central and which actors are peripheral to the network. Block modeling is undertaken to show the relative positions of actors within the network structure. Results show a core/periphery model of Hollywood film actors as well as other interesting role patterns.

ECONOMIC INSECURITY, COLLECTIVE EFFICACY AND FEAR OF CRIME

Johnson, Michele; Britto, Sarah
Faculty Mentor(s): Sarah Britto, Law & Justice

41 (Afternoon Poster Session in Ballroom)

Theoretical models of fear of crime predict that economic insecurity tends to elevate fear of crime, while collective efficacy tends to reduce fear of crime. Given the current economic situation and recent indicators that volunteerism and some other indirect measures of collective efficacy may be on the increase, it is a historically significant moment to assess their relative impact on fear of crime. Data from a 2009 survey of Washington state residents will be used to explore these hypotheses. Additionally, the interaction between both race and gender, and economic insecurity and collective efficacy will be examined.

CELL PHONE NETWORKS

Johnson, Daniel
Faculty Mentor(s): Laura Appleton, Sociology

7 (Oral Session 9:30-10:50 in 135)

This study examines the effects of cellular phone use within and upon the social interactions of college students. The results of a survey administered to university students will demonstrate the volume, frequency, and reciprocity of cell phone interactions. Both verbal telephonic communication and text messaging will be examined. These results will be analyzed in order to discuss the impact of mediated interaction on the structure of social networks. This is a pilot study, and while results are not definitive, they point to promising areas for future investigation into the long term impact of cellular technology.
EXPANDING STUDENT LEARNING OPPORTUNITIES IN SCIENCE AND TECHNOLOGY: SCIENCE TALENT EXPANSION PROGRAM

Johnston, Kathryn
Faculty Mentor(s): Wendy Bohrson, Geological Sciences

40 (Morning Poster Session in Ballroom)

The Science Talent Expansion Program (STEP) at CWU is designed to provide students with enhanced learning experiences in the fields of science, technology, engineering, and mathematics (STEM). STEP focuses on increasing the number of students obtaining STEM degrees, with emphasis placed on increasing the number of traditionally underrepresented students. Students in their freshman year complete the STEP Freshman Science Seminar Series (STEP 101/102/103) which focuses on aspects of STEM fields that are not examined in general classes, such as developing proposals and engaging in research. In STEP 102, students complete group research projects based on a proposal written in STEP 101. This research experience helps students to understand the complexities of scientific research. In STEP 103 students develop skills that help them move into the STEP Bridging Program. The STEP Bridging Program, which is also offered for transfer students, works to pair students with professors who have ongoing research in fields that are of interest to the students. Overall, STEP has served ~250 students from 2003-2009. Early statistical measures suggest that STEP is succeeding at its goal of the improved retention and academic performance of STEM majors: STEP students declare STEM majors to a greater extent than those students who chose not to participate in STEP; students who have participated in STEP have a higher average GPA compared to non-STEP STEM students and compared to the average GPA for the relevant departments; and undeclared-major STEP students have a higher average GPA compared to the undeclared-major non-STEP STEM students.

DESIGN AND TESTING METHOD FOR AN IMPROVED ANTI-ROLL BAR

Jones, Jordan
Faculty Mentor(s): Roger Beardsley, Industrial & Engineering Technology

11 (Oral Session 9:30-10:50 in 201)

This presentation is about the design, construction and testing of an improved front anti-roll bar for a 1989 BMW 325i for a MET capstone project. An anti-roll bar attaches to the two struts on the front suspension. The function of the bar is to restrict the body roll during cornering, and as a result the improved design should provide better cornering capabilities. The design requirements for the bar were for it to improve bar rate between 25% and 45%, not weigh more than the factory anti-roll bar, and for it to decrease the roll angle by 20%. The new anti-roll bar was designed and fabricated in the Hogue Technology machine shop. Bench testing results are presented, along with correlations to in-vehicle testing. The in-vehicle testing for the project was done using a system assembled from an electronic gyroscope, accelerometer and an oscilloscope based data logger.

ASSESSING THE PRE-SERVICE TEACHER

Jones, Kim
Department: Education

32 (Oral Session 3:40-5:40 in 135)

In order to raise outcomes of certified teachers, Washington State is considering the adoption of a new assessment tool (TPA: Teacher Performance Assessment) along with 20 other states. Addressed by this tool are certification requirements for pre-service teachers to submit reflections regarding their context for learning, planning instruction/assessment, instructing students and supporting learning, assessing student learning, and reflecting on teaching and learning. Central Washington University has been chosen to pilot one portion of the new assessment tool with one group of pre-service teaching candidates. The pilot area chosen for this group was “context for learning and planning instruction/assessment.” Upon completion of their tasks for this portion of the new tool, students are asked to complete a survey. Responses will then be considered by the multi-state consortium when fine-tuning the tool until its official adoption and implementation in the near future. Beginning fall of 2012, new pilot pre-service teachers will be completing all portions of the new assessment tool. In this presentation this new assessment tool will be introduced as well as students’ survey responses regarding their experiences going through the reflective process with the context for learning and the planning instruction/assessment portions of the tool. Current challenges and successes of implementing the tool will also be identified by the professor supervising the pilot students.
SUBURBAN MIDDLE AND HIGH SCHOOLS OFFER MORE SERVINGS OF FRESH FRUITS AND VEGETABLES THAN RURAL OR URBAN SCHOOLS

Kangiser, Darrell; Cunnington, Melissa; Tibay, Joseph
Faculty Mentor(s): Ethan Bergman, Nutrition, Exercise, & Health Sciences; Linda Cashman, Nutrition, Exercise, & Health Sciences; Tim Englund, Mathematics

41 (Afternoon Poster Session in Ballroom)

Purpose: From 2004-2005 the third School Nutrition Dietary Assessment Study (SNDA-III) gathered data to determine what food is being offered and served through the National School Breakfast and Lunch Programs. In 2010 The Institute of Medicine released new recommendations that asked for more fruits and vegetables to be offered. The purpose of this study is to examine whether schools are currently meeting the new recommendations using fresh fruits and vegetables. Methods: A sample of 787 middle schools and 791 high schools were compared to find differences in amounts of fresh fruits and vegetables offered in the targeted characteristics, urbanicity (urban, suburban, and rural) and level of community affluence. Survey data were provided by the school’s foodservice managers and analyzed by trained SNDA-III staff. Pearson’s Chi-Square tests were used to determine statistical significance. Results/Conclusions: Both middle schools and high schools in suburban areas (46.1% and 52.0%, respectively) offered significantly more servings of fresh fruits and vegetables compared to urban (24.6% and 35.2%, respectively) or rural (30.0% and 34.5%, respectively) areas. Among the most affluent high schools, 59.7% offered four or more servings of fresh fruits and vegetables compared to 34.6% of the least affluent high schools offering four or more servings. The majority of schools do not satisfy the new recommendations with fruits and vegetables, but the SNDA-III data show what schools need the most assistance.

A MODEL FOR CONSTRUCTING THE GEOGRAPHICAL PROFILE OF A SERIAL KILLER

Kastning, Mary; Dinescu, Monica; Ellis, Jesse
Faculty Mentor(s): James Bisgard, Mathematics

5 (Oral Session 8:00-9:20 in 201)

Our team has been asked to develop a model that will generate a “geographical profile” of serial killers for law enforcement purposes. Thus, we formed a few key assumptions in relation to how the serial killer chooses his victims and commits his crimes. With these assumptions in mind we created a two-scheme model that provides an estimate of the location of future crimes and a corresponding likelihood value. The first step in developing a “geographical profile” was to generate a map that contains all of the murders committed by the serial killer. Then we decided he would try to randomize his kill sites. From an assumption, these locations will be a noticeably far distance from each other. We developed a way to determine a central point, which is the midpoint between the two furthest crime sites. This central point allows us to specify a region in which the serial killer’s home may be. We use this central point in determining an equation that incorporates a growth and decay function, dependent on time. The growth and decay function models the serial killer’s desire to hunt, remain unknown, and avoid the inconvenience of traveling far away distances. The equation computes a value that aids in determining the region of maximum likelihood of a new murder occurrence. Overall, the model provides a reasonable estimation for the location of the serial killer’s next kill, based on the time and locations of past crimes, as well as helps identify his place of residence.
THE IRANIAN CIVIL RIGHTS MOVEMENT AND FUTURE OF THE ISLAMIC REPUBLIC

Kaviani, Khodadad (Khodi)
Department: Education

8 (Oral Session 9:30-10:50 in 137A)

The purpose of this research is to examine the main causes of the 1979 Iranian Revolution and the ongoing struggle of the Iranian people to secure their personal and public rights that can be guaranteed in a republican form of government. Iran under the Shah was an ally of the United States and for the past 30 years, relations between these two countries have been cold and hostile at times. Given its geopolitical importance, Iran can play a pivotal role in supporting the United States in its wars in Afghanistan and Iraq. In addition, the regional rivalry between Israel and Iran can drag the United States into another war with unseen consequences for the region and world. What does the recent civil unrest in Iran reveal about the stability of the regime? What do the Iranians really want? Why is Iran pursuing nuclear technology? Answers to these related and important questions can bring to light the complexity of understanding modern Iran in the context of today's Middle East. The conceptual framework of perversity, jeopardy, and futility (Hirschman, 1991) are used to study this dynamic situation. A variety of primary documents are used to warrant the claims made by this study. Findings show that the Iranian civil rights movement continues to evolve and influence whether Iran becomes a true republic or an Islamic state.

INMATE OTHERNESS: HOW SOCIETY CONSTRUCTS MONSTERS

Keeney, Joe
Faculty Mentor(s): Cynthia Coe, Philosophy

19 (Oral Session 1:00-1:40 in 201)

The question of how to best approach those who break the law invokes many varied responses and equally varied degrees of emotion. Appeals to the humane treatment of incarcerated convicts are oftentimes founded on personal ideals surrounding ethics, ideals that when not shared by others are easily dismissed as wrong or meaningless. In this paper, the issue will be approached by focusing on prisoners that will return to society, while appealing to the idea of the social contract and the mutual respect that members of a society are expected to adhere to if they wish to remain. Studies suggest that contemporary policies surrounding the treatment of prisoners and released convicts lead to recidivism; and in a democratic state where policymakers are appointed as representatives of society, society is the ultimate policymaker. The aim of this essay is to reveal that the resulting treatment of prisoners and furthermore the effects of their relapse back to crime places society itself in breach of the social contract, and this is a more concrete reason for a change in the way the penal system ought to be managed.

THE NUNAMIUT IN THE BROOKS RANGE: AN ANALYSIS OF A FAUNAL ASSEMBLAGE FROM ANIGANIGARUK, ALASKA

Keeney, Joe
Faculty Mentor(s): Patrick Lubinski, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

Aniganigaruk is a Nanamiut Eskimo site located on the North Slope of the Brooks Range, approximately 15 km northeast of Gates of the Arctic National Preserve in Alaska. The University of Alaska, Fairbanks has been in possession of the artifacts from the excavations which were completed in the early 1970s by a team headed by James Corbin. The scope of Corbin’s research however excluded analysis of the faunal remains, and my analysis was the first to be done on these faunal artifacts. The goals of my analysis were to perfect my faunal identification skills and learn as much as I could about the site from the remains in the collection provided. I was able to identify and quantify elements to suggest at least three butchered caribou, produce data which coincides with ethnographic research about the Nanamiut, identify the family of a bird and the species of a rodent, and approximate the size of a possibly butchered arctic bird.
WENAS CREEK MAMMOTH CASTING PROJECT

Keller, Alfred
Faculty Mentor(s): Patrick Lubinski, Anthropology and Museum Studies

26 (Oral Session 1:50-3:30 in 137B)

I have been working on the manufacture of reproductions of the mammoth bones recovered from the Wenas Creek Mammoth Site, near Selah, Washington. Based on my own prior experience with sculpture and cast making, and working in conjunction with the project director, I have developed processes for making silicone rubber molds and urethane foam casts of the bones. These reproductions, painted to resemble the original bones, provide durable, accurate reproductions of the fragile and irreplaceable original bones for use in CWU classrooms and for a wide variety of community presentations. This presentation will include display and discussion of mammoth atlas, humerus, femur, and comparison bone casts and molds.

TOXIC

Kelloniemi, Ashley
Faculty Mentor(s): Therese Young, Nutrition, Exercise and Health Sciences

31 (Performance 1:50-2:30 in SURC Theatre)

My dance, Toxic, was developed as a final project under the direction of Therese Young in choreography class. We were to develop a movement study through an integrated arts approach using three mediums, poetry, visual art and music. The motifs for our project would develop from exploring the interconnected relationships of these sources. To begin we were instructed to find a poem that appealed to us. I picked a poem by William Blake, titled A Poison Tree. To me, the poem represents bottled up angry emotions that are toxic, and how we eventually recognize these emotions and we make a choice. We either give in to them or move on. Next, I looked for visual inspiration that depicted the meaning of the poem. I found a photograph of a reflection of a tree in a pond. The reflection represents the hidden emotions inside us. Lastly, I chose a song by Yael Naim called Toxic. The song is about being consumed with someone that has a toxic effect on you, but instead of fighting it, you give in. When creating my choreography I tried to tie in movements that showed the struggle to move away from the toxicity. I wanted to give the impression that I’m flirting with the idea of giving into my emotions even though I know it is not the reasonable choice. In the end, just like my three art components, I recognize I cannot move on and forget the toxic emotions, and I give in.

USING A WORM MODEL FOR ALZHEIMER’S DISEASE TO EXAMINE THE EFFECTS OF DIFFERENT FATTY ACID DIETS ON DISEASE DEVELOPMENT

Kimuhu, Kinyanjui
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

40 (Morning Poster Session in Ballroom)

Alzheimer’s disease is a progressive and fatal brain disease that destroys brain cells resulting in memory loss, difficulty thinking and behavioral differences. Amyloid Precursor Protein is cleaved into fragments called Beta-amyloid peptide that adhere together to form plaques. These plaques are believed to be the cause of neuron cell death in Alzheimer’s disease. To model Alzheimer’s disease a strain of the roundworm, Caenorhabditis elegans, CL2006, has been generated, which contains the beta-amyloid peptide in muscles causing the worms to undergo paralysis as they age. Stearic acid is a saturated fatty acid also known as “bad fat” which can damage to blood vessels, neurons, and muscle cells. Oleic acid is a mono-unsaturated fatty acid known as “good fat”, which is known to prevent high blood pressure. We were interested in whether or not high-fat diets accelerate the cellular damage caused by Beta-amyloid peptide. To test this hypothesis that “bad fat” leads to cellular damage, we grew the CL2006 strain on plates containing either no fats (untreated control), stearic acid, or oleic acid. The worms were grown at 20 degrees C and tested on the third and fourth day of development for movement by testing their response to touch. We classified the worms as either normal (quick response), partially paralyzed (slow response) or completely paralyzed (no response). Preliminary results show that high-fat diets do not accelerate the development of the Alzheimer’s disease and may in fact be protective against the disease.
JAPANESE INTONATION AND TRANSFER

Kjeldgaard, Marie
Faculty Mentor(s): Charles Li, English; Loretta Gray, English; Joshua Nelson, Foreign Languages

18 (Oral Session 12:00-1:40 in 140)

Intonation plays an important role in the linguistic creation of meaning; many studies, including those of Fernald (1989) and Jusczyk, Cutler, and Redanz (1993), have shown the fundamental nature of intonation in language. Van Els and de Bot (1987) and Kjeldgaard (2008) found evidence that features of intonation can be transferred from a first to a second language. This study examined the English speech of native Japanese speakers to determine if intonational transfer occurred. Recordings were analyzed for reduced pitch range, lack of prominent stress, and declination; all three features are typical of Japanese speech and were present in the participant data. These results support the hypothesis that intonational features from a first language can transfer to a second language.

LACTATE THRESHOLD COMPARISON AMONG ANAEROBIC ATHLETES

Kuykendall, Brandon; Mullen, Bo
Faculty Mentor(s): Robert Pritchett, Nutrition, Exercise, & Health Sciences; Kelly Pritchett, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

This study compared VO_{2} max, lactate threshold (LT) and VO_{2} at LT among aerobic athletes (ARA) (n=10), anaerobic athletes (ANA) (n=9) and untrained subjects (UTS) (n=7). From a treadmill test to volitional exhaustion VO_{2} max and LT (4 mmol L^{-1} lactate concentration) were assessed. VO_{2} max (mL kg^{-1} min^{-1}) was significantly greater for ARA (67.6 ± 9.4) than ANA (53.4 ± 6.4) and UTS (44.9 ± 6.9), with ANA significantly greater than UTS. LT for ARA (82.9 ± 6.4) was not significantly different than ANA (77.5 ± 13.1). However, ARA and ANA were both significantly greater than UTS (66.8 ± 5.4). VO_{2}LT (mL kg^{-1} min^{-1}) was significantly greater for ARA (55.9 ± 7.7) and ANA (41.5 ± 8.6) than for UTS (29.9 ± 4.1) with ANA significantly greater than UTS. Although used to establish groups, VO_{2} max for ARA (vs. UTS) reflect aerobic training adaptations. Similarly high LT would be expected in ARA. Modest VO_{2} max for ANA reflects only a mild stimulus to oxidative pathways (plausibly during recovery from repeated high-intensity efforts). However, anaerobic training appears to provide a stimulus adequate to increase LT. Elevated LT with only moderate changes in VO_{2} max for ANA provide indirect evidence that differential mechanisms alter VO_{2} max and LT. Still, VO_{2} at LT may have the greatest implication with regards to performance. Future research should more directly examine mechanisms between these groups of athletes.

POWERFUL SPECTERS: WOMEN AND GHOSTS LEAVING THE FRINGES IN REALITY AND FICTION

La Paz, Ana
Faculty Mentor(s): Christine Sutphin, English

10 (Oral Session 9:30-10:50 in 140)

During the Victorian era, women were given a public voice by the spiritualist movement, which included women based on the belief that they were better equipped to commune with the spirits due to their innocence. The movement put women in a new position of being listened to by the multitudes. In addition to allowing women heretofore unexplored avenues, the movement empowered ghosts. I illustrate the largely neglected fact that many ghost stories written during the Victorian era reflect women's rising voices of the period. Jennifer Bann, in Ghostly Hands and Ghostly Agency: The Changing Figure of the Nineteenth-Century Specter, states that the doctrine of spiritualism introduced the idea that “the mechanics of death [are] a liberating transition” (667). This idea changed the way in which ghosts were perceived, from helpless chain-rattlers to vibrant and effective beings. The fact that “both spiritualism and the ghost story grew rapidly in the 1850s” is not just a coincidence (Bann 667). Bann argues that the effects of the spiritualist movement’s position on ghosts are evident in the ghost stories themselves. I show that according to this theme of liberation, the mediums and authoresses were connected. The ghosts in the stories I will discuss reflect the growing power of these women. The mirroring of the lives of women through the characters of ghosts can be seen in The Open Door, by Margaret Oliphant; The Old Nurse’s Story, by Elizabeth Gaskell; and The Truth, the Whole Truth, and Nothing but the Truth, by Rhoda Broughton.
LONGITUDINAL PATTERNS OF AQUATIC HABITAT INFLUENCING BULL TROUT SPAWNING SITE SELECTION IN TWO STREAMS OF THE YAKIMA RIVER BASIN, WA

Lamperth, James; James, Paul
Faculty Mentor(s): Paul James, Biological Sciences

16 (Oral Session 12:00-1:40 in 137A)

More recently, focus on fish-stream habitat relations has moved from site specific to more spatially expansive riverscape investigations. In this study, I examined patterns of adfluvial bull trout redd distribution and longitudinal aquatic habitat profiles in two streams of the eastern Cascade Mountains, WA. In each stream, all available spawning habitat (8.2 and 8.3 km, respectively) was delineated into habitat units (i.e. pool, riffle, or glide) which were georeferenced, and characterized by length, wetted width, depth, channel gradient, substrate composition, refuge cover area, cover type, and area of spawning gravel accumulation. Longitudinal stream temperature profiles were created by interpolating values from fixed temperature data loggers, and these values were assigned to each habitat unit. A total of 380 bull trout redds were identified, georeferenced, and assigned to unique habitat units. Data were organized and partially analyzed using a geographical information system. Results suggest suitable spawning patches are characterized by areas of increased instream refuge cover and cool water inputs from groundwater sources.

AN ASSESSMENT OF STREAM HABITAT AND FISH PASSAGE ACROSS INTERSTATE 90 AT SNOQUALMIE PASS, WA

Lamperth, James; James, Paul
Faculty Mentor(s): Paul James, Biological Sciences

40 (Morning Poster Session in Ballroom)

A major highway project to expand Interstate 90 over Snoqualmie Pass, WA was recently initiated by the Washington State Department of Transportation. The project will include the construction of fish wildlife crossing structures and will replace several existing stream-crossing structures to enhance ecological connectivity within the project area. A pre-construction study was conducted in 2008 and 2009 to assess current stream habitat conditions, fish community status and to monitor fish movement through existing culverts and bridges. To accomplish this, treatment and control reaches (~ 200 m in length) were established in each of nine fish-bearing streams within the project area to compare study parameters between areas influenced and areas not influenced by existing structures. Fish movement was also monitored using PIT-tag technologies. Results from this effort show stream habitat in control reaches have comparably larger substrate and less large woody debris than treatment reaches. Of nine fish species documented, westslope cutthroat trout was the most common. Densities (fish/100 m) of westslope cutthroat trout were generally greater in control reaches compared to treatment reaches. Federally listed adfluvial bull trout inhabited one of the streams, and bridge construction over the stream did not appear to affect their migration to spawning grounds. Juvenile Chinook salmon were found upstream of a culvert in another stream indicating fish passage had occurred during spring flows in both years. Fish movements and stream habitat characteristics will continue to be monitored during and after completion of the highway expansion project.

BIOLOGY GOES BEYOND THE CLASSROOM AT ELLENSBURG HIGH SCHOOL

Lannoye, Jennifer; Cottrell, Tom; Arlt, John; Carolan, Lana
Faculty Mentor(s): Tom Cottrell, Biological Sciences

40 (Morning Poster Session in Ballroom)

Biology students participating in the CWU Watershed Activates to Enhance Research in Schools program (WATERS) at Ellensburg High School joined a research team to extend their knowledge beyond the classroom. WATERS is a National Science Foundation funded program that brings graduate students into local classrooms to teach K-12 students about the Yakima River Watershed and to increase their appreciation and knowledge of the natural world around them. Students at Ellensburg High School improved their critical thinking skills by implementing the scientific method when they designed research projects to determine the effects of different fertilizers and other substances on the growth of fast plants. Upon completion of these experiments students were given the option to design a project relating to their own interests. Several students designed individual research projects relating to botany while others branched out to learn more about microbiology, mycology, and ecology. These projects range from lab to field experiments and selected students will be chosen to highlight their research and share the knowledge they gained through this form of inquiry based learning.
WATERS, which stands for Watershed Activities to Enhance Research in Schools, funded through the National Science Foundation, brings graduate students into the classroom to teach K-12 students about the Yakima River Watershed, and to increase their appreciation and knowledge of the natural world. During the fall of 2009, Ellensburg High School partnered with Central Washington University through the WATERS program to take all the biology classes on a full day field trip. With the large number of students who participated, this was a two day event in which students were able to participate in six different educational stations focused on the natural environment. The stations were inquiry based and allowed students to collect data they later utilized in the classroom, covering topics such as water quality, herpetology, stream discharge, vegetation monitoring, ornithology, and geography. This was an excellent way to get students interested in science at the beginning of the school year and the information and experience gained on this trip was a jumping off point for tying their curriculum into the Yakima River Watershed.

WINE FAULT ECOLOGY: SOURCES OF LACTIC ACID BACTERIA THAT CAUSE SPOILAGE
Larson, Kyle
Faculty Mentor(s): Holly Pinkart, Biological Sciences

Lactic acid bacteria (LAB) play a pivotal role in the winemaking process; the conversion of L-malic acid into L-lactic acid, a process termed malolactic fermentation (MLF). Many wine makers use commercial strains to ensure that MLF is completed by a microorganism that is known to not produce any unwanted flavors or compounds. LAB bacteria found naturally in the environment complete the same MLF, however they may produce many undesirable compounds in wine. These compounds reduce wine quality by affecting aroma, palate, visual characteristics and textural qualities such as increased viscosity. The origins of the most common LAB, O. oeni, Lactobacillus sp. and Pediococcus sp., are still mostly unknown. The goal of this research was to determine these origins as well as establishing possible sites of contamination within the winery itself. Soil, leaf, and grape samples have been collected from six vineyards around central Washington as well as samples from common areas inside the wineries themselves (floor drains, storage tanks, transfer hoses, etc). DNA extracted from the samples was used initially to perform polymerase chain reactions (PCR) and gel electrophoresis targeted to spoilage LAB to determine if they are present in the samples. Real Time-PCR was then used to quantify the amount of DNA taken from each sample containing spoilage LAB allowing the quantitation of LAB numbers present at each sampling location. Using this data, likely sites of LAB contamination were identified which will permit more targeted and effective sanitation protocols, limiting their introduction and spread throughout the wine production process.

BILINGUAL EDUCATION, LANGUAGE AND LITERACY ENGAGEMENT
Lea, YiShan; Brook, Kira; Labovitch, Hannah; Lee, April; Balmforth, Lillian; Ramirez, Aldo
Department: Education

Bilingual Education, Language &Literacy Association (BELLA) was created in November 2009. The teacher candidates of Bilingual Education/TESL Program joined their effort with their peers on the basis of the shared academic pursuit in response to the need for linguistic/cultural pluralism. The proposed presentation, put forth by the BELLA members, will share the results of their project, Multilingual Poetry Event, held on Feb 11, 2010, on raising linguistic and cultural awareness. The BELLA members will also share their personal reflections on their experiences in engaging/enlisting participation in the public space in the SURC, CWU. The reflections and gleaned perspectives from the project are informative to the CWU institutional interest on issues of diversity, linguistic symbolic representations and actions. The presenters are the BELLA members- the teacher candidates and a faculty member of the Bilingual Education/TESL Program, College of Education. The structure of presentation will first delineate the inception of the BELLA initiative; second, creating a public engagement in multilingual literary expressions; and third, reflections and implications to the advocacy for diversity in CWU.
INVESTIGATING THE CONSUMER’S CHOICE OF USING REUSABLE WATER BOTTLES OVER DISPOSABLE WATER BOTTLES

Lee, Reda; Campbell, Katie; Floyd, Fawn; Kamalsah, Angie
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

21 (Oral Session 12:00-1:40 in 301)

This research study began with a review of the background of tap water safety, the effect that disposable water bottle production has on the environment, marketing tactics of water bottle manufacturers, and consumer attitudes towards bottled water versus using reusable water containers. This secondary research guided the development and implementation of a survey consisting of university students and the investigation of their preference of bottled water versus tap water, their awareness of issues surrounding the purchase and use of bottled water. Findings and their implications will be presented at this session.

AN ANALYSIS OF THE PROGRESSION OF IDEAS AND AN ARGUMENT ON THE IMPORTANCE OF EDUCATION IN THE GREAT BOOKS

Lehrman, Nathan
Faculty Mentor(s): Karen Turcotte, Douglas Honors College

34 (Oral Session 3:40-5:40 in 137B)

Issac Newton once said, “If I have seen further, it is by standing on the shoulders of giants.” Ideas have been shared since language was first spoken and Newton knew the importance of the exchange of ideas. When ideas are exchanged, you can build upon the work and discovery of others. In this paper I will prove the importance of the sharing of ideas and how being educated in Great Books is vital and necessary in an education program. I will also prove that world-changing ideas are built upon the works of others and I will tie together ideas from literature, from different periods, to prove that people are always building upon the efforts and ideas of others.

TO BE OR NEOTENY, THAT IS THE QUESTION

Lester, Michelle; Wagner, R. Steven; Rice, Tyler
Faculty Mentor(s): R. Steven Wagner, Biological Sciences

40 (Morning Poster Session in Ballroom)

Amphibians vary in the duration of their larval period, determined by both genetic and environmental factors. However, metamorphosis depends on the development and activity of endocrine glands and the hormones they produce (Wilbur and Collins, 1973). Some salamanders and newts exhibit “neoteny” which is the retention of juvenile characteristics in reproductively mature adults (Gould, 1977), and can be both obligate and facultative. Obligate species do not ever undergo metamorphosis whereas facultative can either become neotenic and remain aquatic or metamorphose into a terrestrial adult depending on environmental cues and the individual’s genotypes. As a participant of CWU’s WATERS program, my role in the classroom is to assist in incorporating inquiry based investigations into White Swan High School’s biology curriculum using the Yakima River basin as an overarching theme. I am working with a small research group and we hypothesize that the facultative neotenic Northwestern salamander (Ambystoma gracile) will be influenced by the same environmental cues and ultimately hormones as other species from this genus: A. tigrinum, A. talpoideum, A. dumurii and A. mexicanum. In order to test this we will expose both juvenile and neotenic individuals to near complete evaporation, both separately and in combination with L-thyroxine thyroid hormone treatments (Brandon, 1976). Students will record gill length and tail height, photograph individuals, change water and record water volume, temperature and dissolved oxygen twice weekly. Ultimately, time to complete metamorphosis will be used to tease apart the effects of environmental evaporation and Thyroxine.
AMPHIBIANS AND ROADS: PREVENTING CROAKING TOADS
Lester, Michelle; Barreca, April; Brady, Susan
Faculty Mentor(s): R. Steven Wagner, Biological Sciences; Jason Irwin, Biological Sciences

33 (Oral Session 3:40-5:20 in 137A)

Amphibians are experiencing an extinction crisis and roads have significant impacts on amphibian population viability (Glista et al. 2007). Amphibians are particularly vulnerable where roads intersect amphibian movement corridors and can result mortality rates as high as 98% (Hels and Buchwald 2001). To investigate the movement patterns of Western Toads (*Anaxyrus (Bufo) boreas*) and locate movement corridor “hotspots” within the vicinity of Interstate 90, nighttime driving surveys were conducted along a 16 km stretch of FS 4832, which runs parallel to the freeway. Surveys were conducted in conjunction with the I-90 Snoqualmie Pass East construction project designed to improve ecological connectivity. We conducted 37 surveys between May and October 2009 and found 15 toads on the roadway. Encounters were analyzed with ArcGIS average nearest neighbor resulting in clumped distribution (Z= -2.53, p= 0.01) and two distinct hotspot were then identified using cluster and outlier analysis (≥ ±1.96 SD). Preliminary habitat analysis was conducted in the highest weighted hotspot (N=5) and compared to an equivalent reference transect without toad encounters. The hotspot had significantly less mean overhead canopy cover (70%) and greater percentage of shrub vegetation type (50%) when compared to the reference site with 92% mean canopy cover and 21% mean shrub ground cover using Kruskal-Wallis (p< 0.05). Additional analysis is needed but results suggest that habitat characteristics may be used to identify and prioritize prospective toad movement corridors adjacent to roadways, which could aid in designing and implementing measures to minimize effects of roadways and improve connectivity between populations.

METABOLIC DEPRESSION AND SEASONAL VARIATION IN SUPERCOOLING POINT IN THE MOUNTAIN PINE BEETLE, *DENDROCTONUS PONDEROSAE*
Lester, Jack
Faculty Mentor(s): Jason Irwin, Biological Sciences; Tom Cottrell, Biological Sciences; Lucy Bottcher, Biological Sciences

25 (Oral Session 1:50-3:30 in 137A)

Mountain pine beetles, *Dendroctonus ponderosae*, have experienced significant increases in epidemic outbreak frequency and severity, especially in higher latitudinal and altitudinal extents of their range. Although global climate change may contribute to this trend by raising winter temperature minima above the insect’s lower lethal limit, warm temperatures will also increase energy use during the winter when the beetles are not feeding. This insect does not typically feed following emergence, and low energy reserves have been shown to adversely affect reproductive success. To reduce this effect, we suspect these beetles undergo metabolic suppression through diapause. Additionally, it has been presumed that degree-day accumulation is the only trigger for the resumption of feeding and development in overwintering *D. ponderosae*, leading to the progressive loss of cold hardening. The purpose of this study is: (1) to determine whether *D. ponderosae* undergo diapause and (2) to examine the effect of seasonal progression on supercooling point. The results of this study will contribute to our understanding of the relationship between *D. ponderosae* and climate change, ultimately leading to improved models to predict outbreaks.
YAKIMA WATERSHED ACTIVITIES TO ENHANCE RESEARCH IN SCHOOLS: DAVIS HIGH SCHOOL PROJECT

Lester, Jack; Irwin, Jason; Quincy, Robert; Lester, Michelle

Faculty Mentor(s): Jason Irwin, Biological Sciences; Beth Pratt-Sitaula, Geological Sciences; Carey Gazis, Geological Sciences

40 (Morning Poster Session in Ballroom)

The inhabitants of the Yakima watershed are adapted to a dynamic range of environmental challenges from overwintering in sub zero temperatures to maintaining water balance during hot dry summers. Organisms are often very sensitive to the significant recent changes brought about by the impact of human activities in this area. Therefore, our educational themes have focused on environmental changes and their impacts on physiology and homeostasis. Our students participated in the freezing of Pacific Chorus frogs, *Pseudacris regilla*, to learn about the necessary physiological changes to survive this process, and why this ability is so rare. This lesson provided hands-on experience and real world application to bridge the gap between ecology and physiology. Students have been engaged in an ongoing study which compares the effects of different factors, such as sodium, sugar, and exercise, on their circulatory and respiratory systems. Our spring trimester project is focusing on the factors which control metamorphosis of the northwestern salamander, *Ambystoma gracile*. Some individuals in our montane populations do not undergo metamorphosis and retain juvenile traits. Our study is quantifying the effect of low dissolved oxygen levels on metamorphosis and observing the metamorphic process by introducing environmental hormones to induce it.

INTERGENERATIONAL READING PROGRAMS AND OLDER ADULT QUALITY OF LIFE

Linsley, Michelle

Faculty Mentor(s): Marte Fallshore, Psychology; Jeff Penick, Psychology

41 (Afternoon Poster Session in Ballroom)

The number of elderly people in the United States is continuously increasing. The older population faces many issues in later life including isolation, depression, cognition and memory loss, all which impact their quality of life. Intergenerational reading programs may ameliorate these issues and thereby increase older adults’ quality of life. This study will investigate the relationship between intergenerational reading programs and the quality of life of older adults. Older adults will provide extra reading practice to kindergarten children who are behind in their reading skills. The older adults are currently being recruited to act as reading “coaches” for the children. There will be pre-tests and post-tests measuring the older adults’ quality of life. The older adults who participate in the program are expected to have increased scores on the quality of life assessment scale, showing that the interaction with the children within the program has a positive impact on the quality of life of the older adults.

THE APPLICATION OF AIMSWEB TESTING AND THE RESPONSE TO INTERVENTION TOOL

Little, Suzanne; Acosta, Elaine; Angell, Karen; Thompson, Jamie

Department: Psychology

41 (Afternoon Poster Session in Ballroom)

Due to the changes in the Individuals with Disabilities in Education Act (IDEA), local education agencies can now incorporate response to intervention (RTI) programs to help identify students with learning deficits or special needs. One of the many programs attempting to bridge this gap in education with the goal of early detection is the AIMSweb system. The AIMSweb system is a program consisting of frequent curriculum-based student assessments that through a web based charting and reporting system develops benchmarks used for progress monitoring. AIMSweb is founded on the ideology of early detection of students at risk, developing individual preventive instruction, and breaking the wait-to-fail model. AIMSweb is essentially a three-tier system that uses benchmarks, strategic monitoring, and progress monitoring systems. AIMSweb is the ideal system in that it tests frequently and directly, giving the teachers, administration, and family numerous progress reports. One of the advantages of using the AIMSweb system is its web-based data management system, which highlights the progress of students and allows for within individual comparisons to previous assessments.
The use of modern molecular genetics techniques has enabled researchers to identify the species of origin from relatively small amounts of biomaterials. This ability to generate, analyze and compare genetic sequences from a variety of diverse taxa has been facilitated by the concerted effort of the Consortium to Barcode Life. In vertebrates, DNA “barcodes” are based on the mitochondrial DNA gene \(\text{cox1}\). We obtained a blind bone powder sample from a mammal bone at the Wenas Creek Mammoth site, divided the powder into several portions and attempted DNA extractions on those portions. Preliminary analysis of the extractions indicates the presence of DNA in the extracts and attempts to amplify the \(\text{cox1}\) locus are underway. Any \(\text{cox1}\) sequences obtained from the mammoth site DNA extracts will be aligned and compared with \(\text{cox1}\) sequences of known mammals, including species of mammoth, mastodon, bison, and muskoxen.

The Manastash Creek is a key tributary to the Yakima River, draining nearly 100 square miles of watershed into Kittitas County. Prior to development of the Kittitas valley and the development of irrigation in the area, the Manastash Creek was an essential habitat to steelhead, coho and spring Chinook salmon. In the year 2000, steelhead were listed on the Endangered Species Act and local irrigators approached the Kittitas County Conservation District for assistance with fish passage improvements. Seven unscreened irrigation diversions, constructed before safe fish passage was an issue, are the main problem. If safe fish passage facilities can be combined with improved flows adequate for the runs, the Manastash Project has potential to restore 25 miles of fish habitat. Stage one of the implementation plan is to reconstruct the diversions, providing fish screening and passage facilities. The second stage of the plan is to restore adequate year round flows. At present the lower Manastash Creek is dewatered for three months every summer. This analysis examines two major obstacles: financing the effort and maintaining the collaboration so that the fish do not come to be seen as a threat to the water rights of irrigators and other users on the Creek.

Since NBA off play is coming, we are interested in the rank of Western and Eastern. In addition, we are curious about that how the performances of each team influence the rank and whether they can be modeled and generalized. We will conduct analysis between the winning probability (number of winning games divided by total number of the games played) and average score differences of home and opponents’ scores because we think the average score differences is the biggest factor to predict the winning probability of individual team. We have collected some data from 2009-2010 seasons of NBA games. And, we are going to use regression to analyze the relation between the predictor (average score differences) and the response (winning probability).
INTRODUCTION TO THE WENAS CREEK MAMMOTH SYMPOSIUM

Lubinski, Patrick
Department: Anthropology and Museum Studies

26 (Oral Session 1:50-3:30 in 137B)

The Wenas Creek Mammoth site is a late Pleistocene (Ice Age) bone accumulation near Selah, Washington, that has been subject to annual CWU summer field school investigations since 2005. The site has yielded mammoth and bison bones dating about 16,000 years old, and a few artifacts (chipped stone flakes) of uncertain age. This session introduces the symposium and presents a short video summary of the project.

ARE THEY REAL? A DISCUSSION OF THE WENAS CREEK MAMMOTH LITHICS

Lubinski, Patrick; McCutcheon, Patrick; Terry, Karisa
Department: Anthropology and Museum Studies

26 (Oral Session 1:50-3:30 in 137B)

While the mammoth and bison bones from the Wenas Creek Mammoth site near Selah date about 16,000 years old, it is uncertain if the chipped stone tools from the site are of the same age. Additionally, one could argue whether the stone material represents genuine artifacts or simply geofacts produced by natural processes. We will focus on the latter question, discussing the material and providing the opportunity for audience feedback on the status of these materials.

IMPACTS OF SOCIAL, HUMAN, AND CULTURAL CAPITAL ON COMMUNITY RESILIENCY OVER TIME

Maguire, Conor
Faculty Mentor(s): Rex Wirth, Political Science

41 (Afternoon Poster Session in Ballroom)

Community resiliency is a community’s ability to adapt and change positively when faced with external or internal impacts. A community’s resiliency is largely based on levels of social, cultural, and human capital as well as natural and produced capital. The resiliency of a community is essential in mitigating potential adverse effects brought by changes in resource policy and is instrumental in buffering it from conditions that would otherwise negatively impact social and economic conditions. This presentation will explore how the aforementioned forms of capital contribute to a community’s resiliency through an examination of a 1996 community assessment conducted in Eastern Washington. The findings will then be compared with current conditions in order to assess temporal changes in resiliency. The purpose then is to determine the degree as well as the direction of change in resiliency within a select number of sample communities.

YAKIMA WATERSHED DAM PROJECT

Markley, Chris; Ely, Lisa; Richardson, Brian
Faculty Mentor(s): Lisa Ely, Geological Sciences

40 (Morning Poster Session in Ballroom)

With growth of the human population, the demand for energy increases. The damming of rivers provides the population with a relatively clean form of energy. Dams may also be constructed for other reasons besides hydroelectricity. For example, a dam may be built to control flooding on a river, to provide a source of irrigation, or to meet transportation needs. While these dams provide many benefits, they also create problems by disturbing the natural flow of the river. Throughout the 2010 Winter Trimester students in a 11th-12th grade physics class at A.C. Davis High School in Yakima, Washington, participated in the Yakima Watershed Dam Project. Students were asked to choose a hypothetical site for the construction of a dam along the Yakima River, or one of its main tributaries. Students constructed scale models of the dam at the location, and determined various properties of the dam through various calculations. The main goal of this project was to compel students to conceptualize and understand the various pros and cons of constructing a dam. The project exercised the students’ creativity through the use of models, while enhancing quantitative thinking by having students perform various calculations for their project, culminating in a presentation given in front of their classmates at the end of the trimester.
Sulfonamides are antimicrobial drugs used for treating bacterial infections and induce growth in livestock. As a result of feeding these drugs to livestock they are often found in our water systems and foods, and can cause undesired effects. Work towards the development and testing of a new method for detecting sulfanilamide in solution has been carried out. A chlorophenylurea binding molecule was synthesized and attached to the silica gel surface in order to promote hydrogen bond and dipole-dipole interactions between the silica gel and sulfanilamide. Sulfanilamide solutions of varying concentrations were then added to a determined amount of derivatized silica gel and shaken for two hours before being analyzed using high performance liquid chromatography. The concentrations of sulfanilamide before and after the solutions were shaken, then compared to determine the amount of sulfanilamide bound to the surface of the silica gel. It was determined that sulfanilamide was successfully bound to the surface of the silica gel and the sulfanilamide showed a higher affinity for the derivatized silica gel than the blank silica gel.

This research project addressed the relationship between non-native English speakers’ pronunciation and its intelligibility to native speakers. With an emphasis on non-native speakers’ production of stress patterns, this paper begins with a discussion of English stress patterns and their origins, followed by a presentation of data elicitation procedures. Three UESL students at CWU with a high-intermediate or advanced level of proficiency were recruited as participants, and their readings of a list of sentences containing contrastive stress, emphatic stress, and stress shift (e.g., PROject : proJECT) were digitally recorded. Five native speakers rated the intelligibility of the data by first listening to the recordings and then transcribing them. Results show that stress deviation by non-native English speakers does result in reduced intelligibility; however, other factors, such as syntactic features, pragmatics, and other phonological traits, had greater influence on intelligibility of non-native speech to native English speakers.

In her novella “Cecelia de Noel” Lanoe Falconer describes the beliefs of seven characters in relation to a particular ghost. But the beliefs the characters reveal have to do with more than ghosts; each represents a different scientific or religious paradigm concerning the meaning of life. When the ghost appears to different characters, the fear engendered by its manifestation causes them to reflect on their initial belief systems. Although some change their beliefs and some do not, Falconer nonetheless shows that none of the presuppositions of the first six characters is sufficient to deal with the ghost. But by engaging with the ghost, Cecelia de Noel is able to help rather than judge or fear it. In my paper I intend to show how Falconer’s story is anarchic in its questioning of authority and supports temporary authority over traditional power structures. By contrasting various peoples’ beliefs to de Noel’s actions, Falconer shows it is orthopraxy, not orthodoxy, which matters. She uses the metaphysical to dissect the metanarratives of her day, showing their incongruity and implicit inability to care for the needs of others. The exclusivity of metanarratives is mocked by entitling them as “Gospels,” while Cecelia de Noel’s gospel is prized specifically for its inclusiveness. The story is reminiscent of the anarchic work of Michael Bakunin, who questioned authority that was not based in serving the common good. Through service de Noel solves the problem of the haunting and subverts the authority of the metanarratives of science and religion.
THE COMPOSITIONAL VARIABILITY OF THE GRANITE HARBOUR INTRUSIVE SUITE PLUTON IN THE TRANSANTARCTIC MOUNTAINS

Masen, Tiffany

Faculty Mentor(s): Audrey Huerta, Geological Sciences

41 (Afternoon Poster Session in Ballroom)

The Transantarctic Mountains are a rift-related mountain range that separates East and West Antarctica. The elevation of the mountain rift is ~3500 km long and ranges from sea level to greater than 4500 m, making it the longest and highest mountain rift in the world. As there was no previous data for the Cambrian-Ordovician Granite Harbour Intrusive Suite Pluton in the Transantarctic Mountains, data on mineral assemblages and textures was needed. Samples were collected in the Byrd Glacier region since it cuts into the crust deep enough that it exposes rocks. I was the first person to work with the rock specimens that Professor Audrey Huerta collected and supplied from the Byrd which transects the Transantarctic Mountains. I conducted mineral identification and texture descriptions for hand specimens using a binocular microscope to determine the general mineralogy and textures of the pluton, and to document if there were significant variations in mineralogy and/or texture throughout the pluton. The pluton is made up of Granodiorite and Schistic-Gneise. The mineralogy of the samples showed that the Schistic-Gneise is high in plagioclase, quartz, and biotite, some samples contained traces of calcite, clay, garnet, and muscovite. The Granodiorite is high in plagioclase, quartz, and traces of biotite, calcite and amphibole. Specimens were then crushed up and separated to remove minerals and locate both zircons and apatite crystals for future analysis. I also cut billets and sent them off to make thin sections to also be looked at for future analysis.

SYNTHESIS TOWARDS 3-MERCAPTO-2,4-DIPHENYLBUTANAMIDE AS A POTENTIAL INHIBITOR OF ANTHRAX LETHAL FACTOR

McCammant, Matthew; Priutz, Sarah; Fabry-Asztalos, Levente

Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

40 (Morning Poster Session in Ballroom)

Anthrax is an acute disease that is capable of surviving in a hibernation state for hundreds of years. These dangerous spores have, and will continue, to survive for a long time to come and there is still no way to absolutely control the toxin. If recognized early, treatment is available, but if left untreated, anthrax can be deadly within one week from infection. One of the proteins secreted in the toxin, lethal factor, if controlled could greatly change the treatment of the disease. This research proposes a method to synthesize one such possible inhibitor, 3-mercaptop-2,4-diphenylbutanamide. This potential inhibitor could control the lethal factor enzyme.

A WHOLE PLASTOME APPROACH TO INFERRING THE RELATIONSHIPS IN THE ARAUCARIACEAE

Mei, Wenbin; Smith, Daniel; Chumley, Timothy

Faculty Mentor(s): Linda Raubeson, Biological Sciences

25 (Oral Session 1:50-3:30 in 137A)

Previous studies of the Southern Hemisphere conifer family Araucariaceae have used individual genes (e.g., rbcL alone [Setoguchi et al, 1998, American Journal of Botany 85:1507] or as many as 8 genes [Nian et al, 2009, Chinese Science Bulletin 54: 2648]) and have supported inconsistent phylogenetic hypotheses. Using a conventionally prepared reference plastome sequence for Araucaria columnaris, we designed a primer strategy to amplify the Araucariaceae plastome as 55 overlapping 3-4 kb amplicons. The PCR products then are pooled and prepared for multiplex Solexa sequencing [as in Cronn et al 2008, Nucleic Acids Research 36: e122], generating a million or more, 60-80bp sequencing reads for each taxon, which can then be assembled against the reference genome. Using this method we have generated an additional 27 nearly complete chloroplast genomes in the family Araucariaceae. The species in our study include recently discovered Wollemia nobilis and representatives of all sections of Araucaria (10 species) and Agathis (17 species). Both plastid protein-coding gene sequences and whole plastome sequences will be aligned using species of Podocarpaceae as outgroups. Using this matrix we can address several major phylogenetic issues remaining in Araucariaceae. First, there is a long time debate about the relationship between Araucaria, Agathis and Wollemia. Second, phylogenetic relationships within Agathis, still controversial, will be addressed using 17 species, which is more than any previous study. Third, biogeographic questions can be addressed.
SUPPLEMENTAL INSTRUCTION FOR FINITE MATHEMATICS: DO SUPPLEMENTAL INSTRUCTION SESSIONS INFLUENCE STUDENT’S GRADES OR ATTITUDE?

Mendoza, Adriana
Faculty Mentor(s): Aaron Montgomery, Mathematics

41 (Afternoon Poster Session in Ballroom)

Supplemental Instruction (SI) sessions are provided for college students who would like to improve their grades and their understanding of the course material. The goal of each session is to increase student’s performance and help them understand the material by offering regularly scheduled, and out-of-class review sessions. The research attempts to determine whether there is a correlation between SI-attendance and the attitudes or grades of students enrolled in Finite Mathematics. A Mathematical Attitude survey was constructed and administered to 180 students from Central Washington University enrolled in Finite Mathematics courses. Factor analysis was performed and the researcher determined that the survey measured two types of attitudes: internal motivation and external motivation. An ANOVA was conducted in order to determine a correlation between student attitudes in these dimensions and SI-attendance. There was a positive correlation between SI-attendance and Internal Motivation and a negative correlation between SI-attendance and External Motivation. No correlation was found between SI-attendance and grades.

INCREASING MATHEMATICAL THINKING IN GENERAL EDUCATION MATHEMATICS COURSE: WOULD COMPUTER SIMULATION LABS HELP?

Mendoza, Adriana
Faculty Mentor(s): Mark Oursland, Mathematics

41 (Afternoon Poster Session in Ballroom)

This research centers on studying the effect of implementing Problem-based learning (PBL) with video-based computer simulation instruction. PBL is a student-centered instructional approach in which students collaboratively solve problems and reflect on their experiences. PBL is used to help enhance content knowledge and foster the development of communication, problem-solving, and self-directed learning skills. Video-based computer simulation instruction can help explain a process or model by; adding what is not obvious, providing examples, conveying real life experiences, and adding meaning to the information. The research was designed to determine whether using video-based computer simulation lab instruction increased algebraic thinking in general education mathematics classes at Central Washington University. A pre and posttest was developed and administered to two different general education classes one that used traditional algebraic word problems from a textbook and the other that used two PBL video-based computer simulation labs as instruction in the summer of 2009. The researcher found a statistical increase in algebraic achievement but not a statistical difference between achievement in the control and treatment classes.

INTERNET ACCESS FOR STUDENTS ON CAMPUS AT CENTRAL WASHINGTON UNIVERSITY: CAPACITY AND POLICY

Merz, Michael
Faculty Mentor(s): Rex Wirth, Political Science

41 (Afternoon Poster Session in Ballroom)

Students living in the resident halls at CWU, even though they are forced to pay for it, do not have sufficient internet access to support required academic work. This analysis will deal with the problems, real and alleged of funding, capacity, and communication. (1) Funding can not be allocated due to a cap on housing increases set by the administration because of financial aid restraints which would inhibit the administration’s goal of growing enrollment. (2) Capacity of the K-20 system can not provide more bandwidth even if Resnet had the money to purchase it. (3) Communication of what can and can’t be done and what resources are or could be available is not being shared among responsible parties and with students. The current policy response is to use the packet shaper to prioritize and route all requests made by students. The shaper tracks and records the amount of bandwidth each resident uses in order to further limit each resident to 2GB per 24 hour period when the 2GB limit is reached student’s bandwidth is cut in half and Blackboard assignments must wait until tomorrow. Focusing on improved communication this analysis examines both short term improvement possible within existing constraints and long term solutions to the problem.
Cross-fostered infant chimpanzees, Washoe, Moja, Tatu, and Dar, acquired the signs of American Sign Language through their daily interactions with human caregivers. The peak of their vocabulary growth occurred during their time in the cross-fostering laboratory, particularly in the first 60 months. As adults, they continue to acquire new signs and use them in interactions with humans and each other. Before a sign is included in a chimpanzee's vocabulary, three different human observers must see and record it on three separate occasions. Only signs observed in a well-formed and appropriate manner are considered. Although the rate of vocabulary growth has slowed during their adulthood, the chimpanzees are still acquiring new signs. This paper presents the development of the chimpanzees' vocabularies since they left the cross-fostering laboratory, for a total of 268 new signs. The number of new signs acquired are graphed.

Since the middle of the 20th century, behavioral researchers have been developing innovative and effective educational methods to improve the rate of academic success among students of various ages, ethnicities, and abilities. One of these innovations is a method known as interteaching. Interteaching incorporates elements of behavioral-based teaching methods, yet offers more flexibility to the instructors and structure for the students. A typical interteaching session uses discussion, preparation guides, and class lecture to present the course material to the students. Prior research has suggested that interteaching is more effective than a traditional lecture-based course. However, research has yet to examine which component(s) of interteaching is responsible for this success. The current study compared 6 groups of participants, each of whom participated in a different component of interteaching. Preliminary data analysis supports the prior research findings that have demonstrated interteaching to be more effective than traditional lecture. A component analysis of the results will be discussed when data collection is completed in late April.

Though video games have become a powerful cultural force in the world, there is still little research done on the nature of those people who play these games. Massively Multiplayer Online Role-Playing Games (MMORPGs) have dedicated players numbering in the millions but the data on these players is ignored and unanalyzed. By analyzing the individuals who play these games both in and out of game, a set of markers could be established to identify particular aptitudes in players. To gain a more complete profile of the individual players, an observational research study was performed with four subjects. The investigator spent 4-5 hours with each subject participating in playing World of Warcraft. During this time the subjects playing habits were noted and each subject answered a series of questions to determine personal experience and perception. Between the subjects, a profile could be constructed on each one that accurately portrayed the subjects gaming styles and preferences. It was necessary to combine both impersonal testing with personal interviews to gain a complete idea of the subject’s motivations in gaming. This shows that by profiling the players of MMORPGs, we can develop accurate tests for detecting player aptitudes. MMORPGs could provide a unique avenue for these individuals to showcase their talents where they would otherwise be obscured by standardized testing.
“PLATITUDES”
Milne, Stefan
Faculty Mentor(s): Lisa Norris, English

12 (Oral Session 9:30-10:50 in 202)

This piece is a fabulist/surreal/satirical short story about dead human bodies raining from the sky and the effect of this on humanity over a hundred years. The story is told in brief vignettes that follow a cast of characters into things like government’s reaction to the dead, religions that start in reaction to the dead, and businesses which design products to profit from the dead. These small sections are sub-headed by platitudes. The story shows the loss of meaning associated with things that are perceived as ordinary parts of everyday life.

THE ETHICS OF AUTHORITY
Moceri, Mike
Faculty Mentor(s): Matt Altman, Douglas Honors College

34 (Oral Session 3:40-5:40 in 137B)

In his presentation, The Ethics of Authority, Mike Moceri will argue that policy decisions should be made with deference to two fundamental principles- skepticism and humility. The presenter will analyze the ethical principles grounding a respect for personal and individual authority, and will apply those principles to three policy decisions made by the Federal Government over the past decade. The author will ultimately conclude that there is a dire need for political entities to return to the fundamental principles of classical liberal political philosophy.

AN INVESTIGATION OF HOW CWU FINANCIAL AID STUDENTS SPEND THEIR REFUND CHECKS
Moore, Tiffany; Reimer, David; Wagner, Kevin; Cook, Lindsay
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

13 (Oral Session 9:30-10:50 in 301)

We investigated how CWU students receiving financial aid spend their refund checks. We conducted a survey asking how and where they spend their money. Our hypothesis was that more students spend their financial aid refund chuck on more frivolous products and services rather than saving or planning out their money for coming bills. The findings and their implications will be presented in this session including a comparison to national trends among college students.

PERCEPTIONS OF GUN CONTROL AFTER PRESIDENT OBAMA’S ELECTION
Morgan, Colleen
Faculty Mentor(s): Sarah Britto, Law & Justice

8 (Oral Session 9:30-10:50 in 137A)

This study will examine perceptions of legal restrictions on gun and ammunition sales as well as ownership issues in the United States. Since the election of President Obama, the news media has presented several stories about increased gun and ammunition sales. These stories raise empirical questions involving the public’s interest and concern about the future of gun control and ownership. This presentation will use an Internet survey of over 1,000 individuals, conducted between 2009-2010, to examine participants’ concerns about legal restrictions on bearing arms after President Obama’s election. This research will examine a number of possible correlates that might influence opinions about gun control including race, income, hunting status, media consumption, fear of being a victim of crime, collective efficacy, and punitive attitudes.
EFFECTS OF TEXT VARIATION ON L2 PRONUNCIATION

Moshier, D. A., Laurie
Faculty Mentor(s): Charles Li, English

18 (Oral Session 12:00-1:40 in 140)

The research seeks to determine whether or not textual complexity has any effect on the pronunciation of L2 learners of English. Pertinent to the topic is whether or not L1 transfer of pronunciation features is more prominent when learners have to cope with more difficult and complex texts. It examines current research in pronunciation and intelligibility studies, which emphasize the importance of teaching suprasegmental features when teaching L2 pronunciation. These discourse features, i.e. adjustments in connected speech, play a clear role in NS comprehension of NNS speech. It is anticipated that the NNS pronunciation of English will exhibit variations in common with L2 speakers of English who share the same native language. This study sets out to quantify specific errors and to determine whether those errors increase as the syntactic structure and lexical content of the text become more complex, i.e. difficult. The texts were chosen for their level of difficulty, as determined by lexis, syntactic complexity and narrative style. The present study examines the oral readings of six participants from two different L1 backgrounds, Spanish and Japanese, and looks at pronunciation errors which impede listener comprehension of the text, highlighting and contrasting them with errors due to possible L1 transfer. The results presented findings that support the hypothesis that textual difficulty would affect the pronunciation of L2 learners of English. The study then explores the role of L2 input on learner pronunciation with a view to possible pedagogical implications.

TARGET VULNERABILITIES AND LIVING WAGE CAMPAIGN OUTCOMES IN U.S. CITIES, 1994-2003

Mulcahy, Michael; Trautner, Mary Nell
Department: Sociology

24 (Oral Session 1:50-3:30 in 135)

Efforts by social movement actors to achieve or prevent social change can be directed at a number of different specific targets—states and state actors at the federal, state or local level, for-profit corporations, non-profit organizations such as voluntary associations, religious organizations, or other social movement organizations, or at segments of the population. Previous research on social movements has tended to focus on the characteristics of the movements themselves. As a result, we know little about how social movement target characteristics affect the interaction between movement actors and targets. What attributes of targets make them likely to grant concessions to social movement challengers? In this paper, we contribute to this research with an analysis of the role of target vulnerabilities in social movement outcomes. We critique and extend existing conceptualizations of target vulnerabilities, and apply our conceptualization in empirical analyses of local living wage movement outcomes in U.S. cities from 1994 to 2003. The living wage movement consists of a series of local campaigns pressuring municipal political elites to adopt “living wage ordinances.” These ordinances require businesses that benefit from public resources to pay their employees a “living wage.” We use event history methods to examine the effects of target vulnerabilities on two kinds of living wage movement outcomes: (1) agenda outcomes (whether a decision is made) and (2) policy outcomes (what kind of decision is made). Our analyses of the living wage movement demonstrate that target vulnerabilities matter, but only under specific conditions.
IDENTIFICATION OF NEOCORTICAL PROTEINS THAT INTERACT WITH THE TRANSCRIPTION FACTOR SP8

Mullan, Michael  
Faculty Mentor(s): Todd Kroll, Chemistry

40 (Morning Poster Session in Ballroom)

Neocortex is a mammal-specific brain structure that mediates conscious thought and decision making. During embryonic development, a process termed neocortical arealization assigns the various regions of neocortex to different tasks; these jobs include processing sensory input and regulating motor output. Although several transcription factors (proteins that turn genes on and off) regulating neocortical arealization have been identified, the mechanism(s) through which they control their target genes remains a mystery. It is likely, however, that the ability of these transcription factors to either locate or regulate their gene targets is assisted by physical interactions with additional proteins. One specific transcription factor involved in neocortical arealization is the zinc-finger protein Sp8. This transcription factor is of particular significance because it induces the development of the motor area in the anterior neocortex. In order to acquire insight into how this protein induces the motor area of the neocortex, we seek to identify Sp8-interacting proteins using a yeast two-hybrid screen with a library of embryonic mouse neocortical proteins. Unfortunately, our initial control experiments revealed that Sp8 contains a transcription activation domain and induces autonomous (background) activation of the reporter genes in our yeast strain, making it mandatory to generate a deletion mutant of Sp8 that does not have this activity. We are currently assembling deletion mutants of Sp8 using the polymerase chain reaction that hopefully lack the auto activation domain, which will simultaneously identify the regions(s) of Sp8 that induce transcription activation.

ELLENSBURG STORMWATER MITIGATION IDEAS FROM THE 5TH GRADE — MOUNT STUART ELEMENTARY AND CWU YAKIMA WATERS

Nagorsen, Sarah; Brammer, Cynthia; Pratt-Sitaula, Beth; Hackett, Jennifer  
Faculty Mentor(s): Beth Pratt-Sitaula, Geological Sciences

40 (Morning Poster Session in Ballroom)

The CWU Yakima WATERS (Watershed Activities To Enhance Research in Schools) project is part of a National Science Foundation program aimed at integrating authentic watershed research into K-12 classrooms. As part of the Yakima WATERS project, fifth grade students from Mount Stuart Elementary designed plans to mitigate stormwater runoff problems near their homes in Ellensburg. Each student selected and investigated an impervious surface (e.g., a driveway, roof top, or road) and answered research questions such as, “Where does the water go? What contaminants might the water pick up on the way?” Next, students were given guided access to ArcMap software to develop surface water maps of their study area. Finally, students created solutions to stormwater runoff, and built models, posters, or presentations to showcase their stormwater solutions. Through this project, students developed skills in reading topographic maps and aerial photos, recording field observations, and drafting and constructing models. Other project outcomes included exposure to hydrogeologic concepts and technology such as Google Maps, ArcMap, and Microsoft Powerpoint. Overall this research has helped the students develop a sense of responsibility and stewardship for the Yakima Watershed. Stormwater public education and outreach such as this will become increasingly important as the city of Ellensburg develops and implements a Stormwater Management Plan in the coming years.
GEOLOGIC MAPPING AND GEOCHRONOLOGY TO QUANTIFY FAULT SLIP WITHIN THE ADOBE HILLS, CA

Nagorsen, Sarah
Faculty Mentor(s): Jeff Lee, Geological Sciences

41 (Afternoon Poster Session in Ballroom)

Geologic and geodetic studies indicate the eastern California shear zone (ECSZ) accommodates ~25% of the deformation between the Pacific and North America plates. Within the ECSZ, east of the Sierra Nevada, dextral fault slip is transferred northward onto dominantly sinistral faults within the Mina deflection, including the Adobe Hills, California. Detailed geologic mapping and basalt geochronology was completed within the Adobe Hills to 1) test models for fault slip transfer between the ECSZ and Walker Lane Belt; 2) characterize spatial and temporal variations in fault slip; and 3) test the prediction that 0.4-0.8 mm/yr of Pliocene dextral fault slip is transferred into the Adobe Hills. The Adobe Hills region is dominated by several basalt flows and cinder cones underlain by tuffaceous sandstone and latite ignimbrite units. Basalts and underlying units are cut by ENE-striking left lateral faults as evidenced by linear valleys, left-stepping extensional and right-stepping compressional stepovers, offset ridgelines, normal faults, and contacts. These faults curve into or cut a set of N-NW-striking normal faults that vertically offsets basalt, sandstone, and ignimbrite units. Normal fault scarp heights yield minimum vertical offsets ranging from 10s of meters to over 100 meters. GPS and aerial photo measurements were used to calculate a minimum net left-lateral displacement of 2100 ± 100 m across the Adobe Hills. These offset magnitudes, combined with ages of nearby basalt lavas, yield a left-lateral slip rate of 0.5-0.8 mm/yr. This slip rate is within the range of the predicted rate of slip transfer.

EXPRESSION OF SOLUBLE PFR-5 IN ESCHERICHIA COLI

Nation, Catherine
Faculty Mentor(s): Gabrielle Stryker, Biological Sciences

40 (Morning Poster Session in Ballroom)

Chagas disease, or American trypanosomiasis, is a parasitic disease found throughout Central and South America. It is caused by the single celled parasite Trypanosoma cruzi which is transmitted by the reduvid, or kissing bug, a large blood-sucking insect that often lives in rural homes. Trypanosomes have a unique structure that runs along the length of the flagellum called the paraflagellar rod (PFR). This highly complex protein structure is composed of a lattice of cytoskeletal filaments and is critical for cell motility. These proteins are of particular importance in T. cruzi, as purified or recombinant PFR proteins are immunogenic, protecting mice from an otherwise lethal challenge with the parasite. Two recently described genes were discovered that contain PFR-like sequences, PFR-5 and PFR-6. The aim of this project is to determine the sub-cellular locations of these two proteins within the parasite to determine if they are components of the PFR as their sequence data suggests. This study involves the cloning of a small portion of these genes into the bacteria Escherichia coli and expression of the recombinant proteins in the bacteria. The PFR-6 protein has been successfully expressed in bacteria, however the PFR-5 fragment was shown to be insoluble. A new segment of PFR-5 was therefore cloned into an E. coli vector and appears to be soluble when expressed. These protein fragments will be used to generate specific antibodies to the PFR proteins.
“CELILLO” AND OTHER POEMS
Nelson, Jessica
Faculty Mentor(s): Katharine Whitcomb, English

35 (Oral Session 3:40-5:40 in 140)

“Celilo” and Other Poems gathers representative excerpts from the author’s graduate creative project, Celilo: an Interdisciplinary Exploration of Personal and Regional History. Through poetry, prose, and visual art, the project explores the processes of change and forgetting that we impose on the landscape as a metaphor for the larger way we live our lives. As the title suggests, this reading’s feature poem is about Celilo, a set of waterfalls of historic importance that were once located about twelve miles east of The Dalles, Oregon, on the Columbia River. The long sectional poem melds descriptions of the landscape and its changes over time, as well as historical context, with personal narrative. Particular details of interest include descriptions of historic photographs, excerpts of speeches, research into the importance of the falls as a tribal fishing ground, changes in transportation, and the falls’ final disappearance with the building of The Dalles Dam in 1957. In addition to the poem “Celilo,” the author will also read several shorter poems from the collection that focus on the river. In an attempt to express the mixed-genre effect of the larger creative project, a slide presentation of imagery will augment the reading.

CHRONIC FLUOXETINE (©PROZAC) DOES NOT DIFFERENTIALLY ALTER BEHAVIOR BASED ON AGE IN BALB/CJ MICE.
Newsome, Eluid; Mann, Rusty; Gabriel, Kara
Faculty Mentor(s): Kara Gabriel, Psychology

41 (Afternoon Poster Session in Ballroom)

Clinical depression is a psychological disorder that affects millions of people worldwide and selective serotonin uptake inhibitors (SSRI) such as fluoxetine are often prescribed for treatment. Fluoxetine is approved for the treatment of major depression (including pediatric depression), obsessive-compulsive disorder (in both adult and pediatric populations), bulimia nervosa, panic disorder and premenstrual dysphoric disorder. While little is known about long-term effects of SSRI treatment during adolescence, previous studies in animals have shown that prenatal and/or early postnatal treatment disrupts serotonin development and produces lasting changes in emotion-related behaviors. The current study investigated age-related differences in depression-like behavior following chronic fluoxetine exposure in adolescence and adulthood. While the ratio of water/drug consumption to body weight were closely monitored every 48 hours, male BALB/cJ mice were administered fluoxetine doses ranging from 0 mg/kg, 10mg/kg, and 18 mg/kg in drinking water. This practice was continued over a three week course during adolescence (beginning at ~26 days post birth) or adulthood (beginning at ~56 days post birth). At the end of the three weeks, animals were exposed to the Porsolt Swim Test, a 10-min forced swim test which has been shown to measure depression-like (i.e., immobility) in mice. Total struggle, climbing, and immobility times were analyzed via two-way mixed ANOVA for the factors of age and fluoxetine dose during chronic exposure. No effects or interactions involving age where obtained, suggesting that chronic fluoxetine exposure does not produce differences in behavior depending upon the age at which it is administered.
CLEARWIRE CORPORATION QUALITY MANAGEMENT RESEARCH

Nguyen, Tony; Maruyama, Reo
Faculty Mentor(s): Kun Liao, Finance & OSC

CWU-Lynnwood Poster Session

The research is to gather data and information about Clearwire Corporation and its quality management procedure. Along with collecting the data, the research will analyze the current quality issues, how Clearwire has resolved past quality issues and an in-depth analysis for higher quality management and service. Clearwire Corporation is a wireless internet service provider founded by Craig McCaw and based out of Kirkland, Washington. Clearwire provides broad-band speed internet service with innovating telecommunication technology with markets in the United States, Europe and Mexico. The research will attempt to solve the issues within Clearwire Corporation that pertain to; the poor quality, performance and high statistical failure of its services (slow board-band speeds), the availability of its network for maximum capacity of service, failure for innovation and development of next generation telecommunication products, the dependency on third parties to develop telecommunication systems, software and hardware. Aside from researching Clearwire Corporation’s history, past and current solutions, the research will explore the whole structure of the corporation’s quality management, the third party partners, and derive a cost effective and timely solution.

TRENDS IN PRECIPITATION CHEMISTRY AT MOUNT RAINIER OVER THE PAST 22 YEARS

Nieber, Annika; Rybka, Sara; Sorey, Mari
Faculty Mentor(s): Anne Johansen, Chemistry

40 (Morning Poster Session in Ballroom)

The ongoing Mount Rainier Project at CWU was initiated in 1988 and entails the regular monitoring of precipitation chemistry at the high elevation Paradise Ranger Station situated within the National Park. As part of the cooperative agreement between The National Park Service (NPS) and CWU, students receive and handle weekly precipitation samples that are analyzed in the EPA accredited Environmental Testing Laboratory of the Department of Chemistry. The following chemical components are quantified; pH, conductivity, sulfate, chloride, nitrate, sodium, ammonium, potassium, magnesium, and calcium. Data is averaged over 3-months intervals, i.e., divided into 4 quarters per year, tested for significance of trends throughout the 22-year monitoring period (Student t-test), and compared with analogous data collected at established National Atmospheric Deposition Program (NADP) sites throughout the state. The most interesting results are that over the last two decades, significant negative trends are observed for sulfate and nitrate at Mt. Rainier, both of which are the main contributors to acid rain, which explains the associated average increase in pH by ~0.1 pH unit from 5.2 to 5.3 (P=0.15). These results indicate that pollution standards have contributed to decreasing acid rain in this pristine and vulnerable high elevation location that could potentially be impacted by pollution from the Seattle Metropolitan Area as well as from Asia.

OSC 324 QUALITY IN APPRAISAL SERVICES

Nur, Nader; Thome, Dylan; Sunito, Wahyu
Faculty Mentor(s): Kun Liao, Finance & OSC

CWU-Lynnwood Poster Session

Our project will be based around a local real estate appraisal company located in Kirkland, WA. We will study their quality management issues and how they are being solved. Also we will also look at what current issues that they have and how we would help to solve them. The company itself consists of 5-7 employees all of which are working on a contract basis. Obviously due to current market conditions they are not doing as well as they used to however they are not in the red either. We will be actively working with the owner/operator to improve any quality issues they may have and hopefully help improve the bottom line.
PREPARATION AND CHARACTERIZATION OF A DERIVATIZED SILICA GEL
Nye, Patrick
Faculty Mentor(s): JoAnn Peters, Chemistry

37 (Oral Session 3:40-5:40 in 202)

Derivatized silica gel has potential to be used in applications such as chemical sensors and stationary phases for separation and purification of chemicals. The use of a chemical dye to detect binding events may provide an inexpensive, robust, and easy to use method for detection of hazardous materials in water samples. A silica gel material designed to selectively bind organic acids was prepared by derivatization with 1-trimethyloxysilylpropyl-3-guanidinium chloride using a combination of reflux and Soxhlet extraction in isopropanol. Work towards a method for the characterization of the binding behavior of this material was carried out. Binding assays were performed by stirring the derivatized silica gel with an analyte solution for two hours, followed by centrifugation, and analysis by UV-vis spectroscopy. Analytes tested include phenylsuccinic acid, 5(6)-carboxyfluorescein, and alizarin.

SYNTHESIS TOWARDS 1,3-AZABORINES AS POTENTIAL NOVEL INHIBITORS OF HIV-1 PROTEASE
Nye, Jesse
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

4 (Oral Session 8:00-9:20 in 140)

HIV/AIDS has affected about 40 million people. One type of drug that is used to treat HIV/AIDS is a protease inhibitor. HIV-1 protease is one enzyme responsible for the propagation of mature viral particles. By inhibiting HIV-1 protease it is possible to slow the replication of the virus and delay the onset of AIDS. Often, HIV-1 protease becomes resistant to inhibitors; therefore, new drugs are needed. Here, we propose the synthesis of novel protease inhibitors using known and novel synthetic methodologies. The proposed structures are borinic acids containing a heterocyclic ring with a nitrogen in a 1,3 relationship to boron. Similar non-heterocyclic compounds have shown good inhibitory values and we hope that these inhibitors will possess better inhibitory properties, have increased bioavailability, have less toxicity, and potentially be more stable than their non-heterocyclic counterparts and the protease inhibitors currently in use. Important intermediates have been synthesized and are being used in the final reactions of the proposed synthetic scheme. We hope that these compounds will become lead compounds for further drug discovery for HIV/AIDS.

THE MOTION PICTURE CLUB
O'Banion, Sean
Faculty Mentor(s): Michael Ogden, Communication

14 (Performance 9:30-10:50 in SURC Theatre)

The Motion Picture Club Characters - Sean O’Banion: Sean is President of the Motion Picture Club. In the film we are given a view of the way Sean runs things and the complications that ensue in his position as club president. Kyle Boynton: Kyle is the Vice President and in the film we are provided further insight through flashbacks of Kyle’s experiences with the club. Kaitlin Larson: Kaitlin is the Secretary and in the film we gain further knowledge of the life of the club through her experiences. Zach Markwith: Zach is the Senator, and in the film we are provided more insight into the life of the club based off Zach’s experiences. Allen Huerta: Allen is the unofficial editor of the MPC. Plot Summary- Sean is the President of the Motion Picture Club at CWU and in this short film we are given a look into the life of the club through Sean’s stumble-bum approach to running things as president. Throughout the film we are given further insight into the club through flashbacks presented by its members. These interviews coupled with the club’s adventures and misadventures in filmmaking paint a picture of their struggle to maintain themselves as filmmakers and their position as the predominant Film & Video club on campus. This 15 minute piece presents a cinematic approach to filming a television show while playing off the comedic stylings of the hit TV series The Office.
UNEARTHING A MAMMOTH, FINDING A STORY: DOCUMENTING THE WENAS CREEK MAMMOTH PROJECT

Ogden, Michael
Department: Communication

26 (Oral Session 1:50-3:30 in 137B)

Every film begins as a story. How mammoth remains unearthed by happenstance on ranch land in the Wenas Valley of central Washington State transformed into a multi-year interdisciplinary field school is a compelling story. The making of a documentary--shot over several years--is also a compelling story. The documentary’s primary goal is two-fold: to chronicle the process of an archaeological excavation; and, to communicate the significance of the mammoth find to the general public. The practicalities of realizing these twin goals will be the subject of this presentation accompanied by select clips from the finished program.

THE LACUSTRINE SEDIMENT RECORD AND GEOMORPHOLOGY OF THE WEST CRATER LAVA DAM ON THE OWYHEE RIVER, SOUTHEASTERN OREGON

Orem, Caitlin
Faculty Mentor(s): Lisa Ely, Geological Sciences

1 (Oral Session 8:00-9:20 in 135)

Multiple lava dams and correlative lakes impacted the Quaternary evolution of the Owyhee River, Oregon. The youngest and best preserved is the West Crater lava dam, which entered and blocked the river ~ 70,000 years before present (70 ka). Sediments that accumulated in the lake behind the West Crater lava dam were investigated to help understand the effects of the lava dam and lake on the Owyhee River and to understand sedimentation and lake paleoenvironments. West Crater lake sediments are predominantly silt-sized grains, but local sediment supplies of larger sand-sized grains did occur. Diatoms within the lake sediments give insights into paleolake conditions. Sedimentation rates were quantified between two separate airfall tephra layers within the lake sediments with ages of 50 ± 5 ka and 46 ± 5 ka. Geomorphic evidence and cosmogenic dates from the West Crater lava dam and related terraces indicate that the dam duration consisted of five stages (1) dam emplacement and lake formation at ~70 ka; (2) dam overflow and lake sedimentation from ~70-42 ka; (3) rapid removal of upper dam, lake termination, and fluvial incision from ~42-36 ka; and (4) gradual incision of lower dam and fluvial incision from ~36-10 ka; and (5) incision to modern river level. The WC lava dam lasted ~28,000 yrs before incision began and ~32,000 yrs of episodic incision was needed to reestablish the river. Information from this study gives new perspectives on the extensive effects of lava dams and their lakes on fluvial landscapes.

SYNTHESIS OF Eu^{2+} DOPED SrB_{4}O_{7} AND Sr_{3}B_{2}O_{6}

Orme, Patrick
Faculty Mentor(s): Anthony Diaz, Chemistry

40 (Morning Poster Session in Ballroom)

Luminescent materials also known as phosphors are used to generate visible light in many display and lighting applications. These phosphors consist of a host that is doped intentionally with a small amount of impurity such as Europium which is responsible for the emission of light. We are studying Eu^{2+} doped materials because Eu^{2+} is unique in that it generates a wide range of wavelengths in the visible light spectrum. We are always looking for new ways to get Eu^{2+} into new lattices so that we can produce novel materials. The synthesis of SrB_{4}O_{7}:Eu^{2+} involves grinding stoichiometric amounts of strontium borate, boron oxide, and europium oxide and then firing in air at 700°C for 3 hours. The sample is then reground and fired under 0.5% hydrogen at 850°C for 10 hours, and finally washed with nitric acid to remove unwanted byproducts. The synthesis of Sr_{3}B_{2}O_{6}:Eu^{2+} includes adding stoichiometric amounts of SrCO_{3} to SrB_{2}O_{3}:Eu^{2+} and firing again under hydrogen.
PODOCARPACEAE PHYLOGENY: EVIDENCE FROM THREE EVOLUTIONARY PERSPECTIVES
Owart, Birkin
Faculty Mentor(s): Linda Raubeson, Biological Sciences

25 (Oral Session 1:50-3:30 in 137A)

The second largest family of conifers, the Podocarpaceae, exhibits a remarkable amount of diversity. Although currently less well known and commercially viable than some other conifer families, the Podocarpaceae nonetheless have immense ecological value most notably in the forest communities of Australasia. Despite efforts by other scientists, generic relationships within the family remain controversial. To formulate and support new hypotheses, this investigation uses an expanded set of sequence data relative to previous studies, as well as using an integrated approach of three evolutionary perspectives, i.e. using sequences from each genome: \textit{nad5} (mitochondrial), \textit{atpB} and \textit{atpE} (chloroplast), and XDH (nuclear). The \textit{atpB} and \textit{atpE} genes have been used in fairly wide application in phylogenetic studies, however they have been used to a lesser extent in the Podocarpaceae family. In comparison, \textit{nad5} has been used less so in general and the XDH gene has hardly been used at all as a marker. Data collection to include 26 representatives of the Podocarpaceae is currently being finalized. Once the data matrix is complete, phylogenetic analyses will be undertaken on the genes individually and in combination.

CONNECTING THE SWAHILI PEOPLE TO THEIR PAST
Palmaer, Erika
Faculty Mentor(s): Joe Lorenz, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

How far back can we trace a civilization’s heritage? For as long as we can comprehend, societies have wandered to new homelands, been pushed out, have conquered and been invaded; all of which causing a genetic drift across continents. What are the chances that we are even related to the people buried below us? Using skeletal materials found on the coast of East Africa dating as far back as 1000 years ago, we will gather valuable information about the people and determine the genetic continuity between the inhabitants of modern day Swahili and those of long ago. Our first step will be attempting to extract DNA from the skeletal samples. We have to be very careful to avoid contamination from other sources because the amount of DNA from samples this old will be very small and any fresh DNA that happens to fall into the solution will drown out the information from the sample. If our extraction works, we will then isolate the HVR1 segment of the mitochondrial DNA to determine their genetic origins and compare these results to that of living populations.

SEASONAL MOVEMENTS AND OVERWINTERING OF WESTERN TOADS (Bufo boreas)
Palmeri-Miles, Amber
Faculty Mentor(s): Jason Irwin, Biological Sciences

33 (Oral Session 3:40-5:20 in 137A)

Despite the western toad’s (\textit{Bufo boreas}) widespread distribution, populations are in decline, even in undisturbed areas. In Washington State they are a species of special concern and in several states they are listed as endangered. Western toads are good candidates for anuran movement studies because they migrate long distances between breeding areas, foraging ranges, and overwintering sites. Through the use of radio telemetry I am observing western toad movement patterns throughout the entire year and characterizing the habitats required, including the selection of overwintering sites. Toads are captured at breeding sites (the only time they can be found in large numbers) near Snoqualmie Pass, WA and outfitted with radio transmitters (BD-2, Holohil Inc.) mounted on waist-belts made of surgical tubing. To locate overwintering sites the toads must be observed every 2-3 days throughout the year, because western toads can travel more than a kilometer in one day, exceeding the range of radio telemetry equipment in many locations. The depths at which western toads overwinter are currently unknown. By comparing the temperature of the toad in its overwintering site with adjacent ground temperatures, overwintering depths can be determined. Preliminary data (\textit{n}=3) indicate that Holohil BD-2T (temperature sensitive radio transmitters) don’t accurately portray overwintering temperatures and other means of determining these temperatures is necessary. Other outcomes of this research will be patterns in seasonal movements, differences in distances traveled between the sexes, sexual preference of overwintering sites in relation to distances from breeding grounds, and seasonal patterns of weight gain or loss.
HAMSTERS INFECTED WITH THE HOOKWORM, *ANCYLOSTOMA CЕYLANICUM* SHOW PRE-ANEMIA CHANGES IN BEHAVIOR

Parker, Joshua; Ring, Ian
Faculty Mentor(s): Kara Gabriel, Psychology; Blaise Dondji, Biological Sciences

41 (Afternoon Poster Session in Ballroom)

Geohelminth infections including hookworm are among the most common infectious diseases of humans. In children, anemia and protein malnutrition resulting from chronic hookworm can cause growth delays as well as intellectual and cognitive deficits. In animals, parasitic infections at sub-clinical levels may alter host behavior in a variety of ways, including responses to predators and mate selection. In the current study, three-week old male Golden Syrian hamsters received infectious third stage larvae of the hookworm *Ancylostoma ceylanicum* via oral gavage. Age- and sex-matched uninfected hamsters were used as controls. At day 11 post-infection and prior to peak anemia, anxiety, exploration, and activity were measured during a five min open field test. The following day, aggressive and social behaviors were measured during a ten min social interaction test. Separate MANOVAs were utilized in the preliminary analyses of the two data sets, revealing overall behavioral differences between the infected and control groups in both open field and social interaction (*p* < 0.05). Follow-up analyses with separate ANOVAs yielded no differences between groups for any specific behavior in the open field. In the social interaction test, infected animals showed lower duration of fighting and pinning than controls. These results indicate that pre-anemia hookworm infection can produce subtle changes in complex behavioral patterns in the absence of overall activity changes.

MOBILE PHONE TECHNOLOGY AND ITS EFFECT ON AFFECT: IS TECHNOLOGICAL DEPENDENCE THAT SERIOUS?

Parker, Joshua
Faculty Mentor(s): Susan Lonborg, Psychology; Kara Gabriel, Psychology

41 (Afternoon Poster Session in Ballroom)

This study aims to determine if a correlation exists between trait anxiety and mobile phone problem use and dependency and if there is a relationship between the absence of a person’s mobile phone and levels of experiences state anxiety, as well as examining the psychometric properties of the various measures that are employed in this study. These measures which are used to assess mobile phone dependency and problem use are the Mobile Phone Problem Use Survey (MPPUS), the Short Message Service Problem Use Diagnostic Questionnaire (SMS-PUDQ), and the Cell-phone Overuse Scale (COS). The measures used to assess state and trait anxiety are the State-Trait Anxiety Inventory (STAI) and the State-Trait Inventory of Cognitive and Somatic Anxiety (STICSA). A measure of social desirability, the Social Desirability Response Set Five item Survey (SDRS-5) will also be used. These measures have all been investigated in terms of reliability and validity and have been found to be relatively effective measures of their respected constructs, however this study provides a means of further investigation on these topics. This study expects to find that state anxiety levels rise when subjects do not have access to their mobile phones, and that there is a correlation between levels of trait anxiety and the severity of mobile phone dependence. This research has many implications that are applicable and relevant to many areas of concern, including clinical intervention and treatment of technological addiction, as well as broadening our scientific understanding of the human condition as a whole.
THE ROLE OF ARGinine Vasotocin DURING FREEZING OF THE PACIFIC TREE FROG

Pense, James
Faculty Mentor(s): Jason Irwin, Biological Sciences

Currently little is known about the physiological adaptations that allow the Pacific Treefrog to survive freezing, a phenomenon known as “freeze tolerance.” Two important physiological responses allow frogs to survive freezing: First, the frog releases massive amounts of glucose into its blood while it is freezing, and second, its organs lose large amounts of water to reduce the amount of ice forming in the tissues. It is believed that the released glucose allows cells to continue the process of anaerobic respiration, which would create enough energy to keep their cells alive while frozen. Epinephrine has been shown to have an important role in releasing glucose into the blood, but little is known about the role of arginine vasotocin (AVT, a hormone with major effects on water balance in amphibians) in the freezing process. The purpose of this experiment is to understand the role of AVT during freezing by injecting frogs with AVT or a AVT inhibitor, then measuring the effects on glucose production and water content of the liver and leg muscle. AVT is expected to improve the movement of water out of the organs and increase blood glucose levels during freezing.

ELYSIA SWEETHEART DRESS

Peterschmidt, Bernadette
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

My project, the Elysia Sweetheart Dress, is a fully lined, high-waist, circle skirt dress, inspired by the fashion of the 1950s. It was created to be a fun and flirtatious summer dress, with a hint of historical reference. This dress is my original design, in which I draped the garment, created a flat pattern form the draped pieces, and made a sample from the pattern, before I created the final piece. This is one of a line of three garments; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in Milo Smith Theatre in McConnell Hall.

ETHNIC TERROR IN THE PACIFIC NORTHWEST

Peterson, Anthony
Faculty Mentor(s): Nelson Pichardo, Sociology; Micheal Harrod, Sociology

Although many would believe that racial cleansing and terror was not a feature of American history, the facts of the matter present a different perspective. The phenomenon of sundown towns (the exclusion of racial/ethnic groups from residing or staying in town overnight) and banishments (the use of open terror to expel residents of color from any given town or county) has been a prevalent fact of American history. Authors James Loewen, Elliot Jaspin, and Jean Pfaelzer have chronicled several instances of banishments and sundown towns directed at African Americans and Chinese. Sundown towns, as well as banishments, emerged in the late 19th Century, in communities where non-Caucasians were systematically excluded from residing or passing through a town or city after the sun went down or where they were driven out. Most of the focus has been on African American experience in the South and Midwest and Chinese experience on the West coast. This study builds on previous research by focusing on the relatively overlooked area of the Pacific Northwest (Idaho, Oregon and Washington State) and by broadening the focus to include a wider range of racial groups. This hidden history is examined through census data that is compiled for each decennial census for cities/townships over 10,000 in population in the three states. Places with dramatic population declines were noted for further investigation. Reasons for population shifts were explored through population drops of 50% or more in racial population. Additional inquiry research is pursued to uncover the causes for population change.
QUALITY IMPROVEMENT
Pham, Mai
Faculty Mentor(s): Kun Liao, Finance & OSC

CWU-Lynnwood Poster Session

Mai Pham, Natalie Strzelecki-Shutov OSC 324, L01 Team Project Abstract April 14, 2010 Quality and continuous improvement is a field that helps businesses and organizations deliver higher quality products and services. Universities are such organizations that should evaluate their performance measurements all the time in order to ensure that their students will acquire high quality education and become respected professionals after graduation. Central Washington University’s Lynnwood campus is a place which opens opportunities to receive business and accounting degrees for students living around Lynnwood. At first glance campus has variety of degree minors available in addition to its major programs. It also has great professors and flexible class schedules from quarter to quarter. However its general student services such as enrollment, financial aid, and writing center require some significant changes. As a group, we would like to propose several quality improvement ideas such as reorganization of campus floor usage and addition of new student services such as tutoring center and bigger library. We hope that these changes will help CWU at Lynnwood become more competitive and attractive place for current and future students.

NATIONAL TRUMPET COMPETITION – ENSEMBLE DIVISION
Pickard, Stephen; Henderson-Wans, Christi; Martinson, Sarah; Hinckley, David; Stein, Jon; Fredrickson, Chris
Faculty Mentor(s): John Harbaugh, Music

22 (Performance 12:00-1:40 in SURC Theatre)

This presentation is a recap of the CWU National Trumpet Competition (NTC) Sextet's performance at the 2010 National Trumpet Competition. This is Central's 5th consecutive invite to NTC, and they were the only school to represent the west coast in their division. A video of our performance will played along with an explanation of what kind of time and preparation goes into this competition, such as choosing music, practice time, and how we eventually end up getting to the competition.

THE ITALIAN INFLUENCE ON THE SHIFT FROM CORRALES TO COURT THEATRE IN SPANISH GOLDEN AGE THEATRE
Pierson, Kate
Faculty Mentor(s): Nadine Pederson, Theatre Arts

9 (Oral Session 9:30-10:50 in 137B)

The Renaissance began in Europe around the 14th century and the changes occurring during this time greatly affected the development of theatre. Italy’s Renaissance provided innovative ideas on scenic design, theatre construction and the start of Commedia dell’arte troupes. Originating in Italy, the new developments spread throughout Europe. Spain, unlike Italy, England and France, lacked a theatrical tradition due to the presence of the Moors and Islam who discouraged theatre. Catholicism became the official religion of Spain around 1492, allowing for a reemergence of religious drama. This lead to Spain experiencing a prosperous period of theatrical development often called Siglo de Oro or the “Golden Age.” Italy provided the basic framework for the development and growth of Spanish theatre because of its dominance in theatre during the Renaissance, the traveling troupes and its close proximity to Spain. Therefore, which aspects of Spanish theatre were original and which did they borrow from their Italian neighbors? The area that I will be exploring is the influence Italian theatre practitioners had over the Spanish theatre, specifically in the development of the uniquely Spanish corrales performance space. Then I will examine the possible causes in the shift from the corrales towards court theatre, which was found all-throughout Europe.
THE EFFECTS OF PLANNING AND TELLING LIES ON MEMORY FOR THE TRUTH
Polage, Danielle
Department: Psychology

24 (Oral Session 1:50-3:30 in 135)

This study assessed the effects of lying on memory and the impact of planning and telling the lies on likelihood to believe ratings. Participants initially rated the likelihood that several life events happened to them before age ten. Participants were asked to write and tell about several true and false events. Participants were told that the experiment was testing handwriting analyses and interview techniques designed to detect deception and were encouraged to do their best at convincing the reader and interviewer that all of the stories were true, regardless of their veracity. The participants planned two lies in advance by answering (in writing) probing questions about the supposed event. Participants were then involved in an interview session with an experimenter on two of the four lie items (one of which was prepared and one which was not). After the lie sessions, participants again rated the likelihood that the events actually happened to them; this post-test was compared to the pretest scores. Results suggest that lying may increase a person’s belief that the lied about event was true. It also appears that telling a lie with the attempt to convince another that the lie is true is more influential on memory change than is preparing for a lie that is never told. Future research will examine whether the number of times a lie is repeated will increase believability of the lie. The application of this research to everyday life and the legal field will also be discussed.

SHORT FALLS OF FEDERAL FINANCIAL AID
Ponce De Leon, Anthony
Faculty Mentor(s): Rex Wirth, Political Science

20 (Oral Session 12:00-1:40 in 202)

Every year there are students that are left behind in the United States because they are not given an opportunity to pay for their education. Bright, eager students are disadvantaged by the current tools and measurements used by the Federal Financial Aid system and are left with the unfair burden of private loans or substandard educations. With the economy making it more difficult for families to contribute to their children’s educations, with an already significant national debt, and with a college education becoming more important every year in the work force, it is clear that something must be done. The amount of money that each student receives in federal unsubsidized and subsidized loans and grants is calculated using an outmoded model that includes inappropriate measurements of a family’s ability to pay. The problem is further exacerbated by an overemphasis on grants, that help too few and return nothing, and an under emphasis on loans that are equally beneficial and return money to the system. Given the other problems pressing on governmental budgets this analysis looks at ways that policy change along these two dimensions might remedy the problem using existing resources.

USE OF MODULATION IN RESPONSE TO REQUESTS FOR CLARIFICATION IN CHIMPANZEES (PAN TROGLODYTES)
Potosky, Robin
Faculty Mentor(s): Mary Lee Jensvold, Chimpanzee and Human Communication Institute

28 (Oral Session 1:50-3:30 in 201)

Signs of American Sign Language (ASL) are modulated to change meaning, including establishing loci, facial expression, eye gaze, direction, size, speed, holding signs, duplicating signs and reiterating signs. As infant chimpanzees, Washoe, Moja, Tatu, and Dar were raised like humans and acquired their signs in that environment. Like human signers the chimpanzees modulate their signs. Videotaped interactions of the chimpanzees as adults show they use different types of modulation in response to a series of questions (Shiau, 2005). This study extended previous research to examine modulation in utterances classified as expanded, subtracted, modified, and novel. The chimpanzees used a variety of modulation in their responses to a series of general questions. There were also individual differences in their use of modulation. Washoe and Tatu’s use of modulation was dependent on the different functional categories of the signs, using more modulation on locatives and markers. The chimpanzees also used different combinations of modulation on their signs. They also used face orientation in patterns similar to those of adults during conversations, looking away as a speaker and towards as a listener.
INVESTIGATING THE FUNCTION OF GD$^{3+}$ IN (Y,GD)BO$_3$:EU$^{3+}$ THROUGH TRANSFER EFFICIENCY MEASUREMENTS

Rabinovitz, Rosa
Faculty Mentor(s): Anthony Diaz, Chemistry

37 (Oral Session 3:40-5:40 in 202)

The optical properties of gadolinium and europium doped samples of yttrium borate were assessed to determine a quantitative value for the host-to-activator energy transfer efficiency under VUV excitation. Emission, excitation, and reflectance data were collected through VUV spectroscopy. A plot of the energy transfer versus europium concentration was used to illustrate the behavior of the system with increasing amounts of europium. The $\alpha/\beta$ ratios for each gadolinium sample set were calculated from trends given by the inverse energy transfer plot. These values show that with an increase of gadolinium in the crystal lattice, the $\alpha/\beta$ ratio increases. This indicates that there is a higher electron mobility resulting from a greater quantity of e-h pairs locating a europium site compared to a killer site when there is gadolinium incorporated into the lattice.

ISOLATION AND CLASSIFICATION OF BACTERIAL VIRUSES PRESENT IN SOAP LAKE

Rambo, Amanda; Nitz, Kenie; Webb, Hannah
Faculty Mentor(s): Holly Pinkart, Biological Sciences

40 (Morning Poster Session in Ballroom)

The purpose of this project is to isolate, characterize, and classify bacteriophages present in Soap Lake, a saline alkaline lake in Grant County, WA. Bacteriophage (bacterial viruses) are thought to impact bacterial diversity in many environments, both by control of bacterial population size, and by transfer of genes between bacteria. Bacteriophage are classified as either lytic, which simply reproduce then kill the bacterial host by bursting the cells, or as lysogenic, which insert their genetic material into host cell chromosomes, and reproduce as part of the host. Lysogenic bacteriophage are thought to be particularly important in the evolution of bacteria during times of stress. It is hypothesized that Soap Lake will contain lysogenic, broad host range bacteriophage. Water samples were obtained from Soap Lake and host bacteria and viruses were isolated by suction filtration. Host strains were cultivated on agar that simulated the alkaline pH, high salinity conditions of Soap Lake. Host strains were incubated for 5-7 days at room temperature. From the host strains, plaque assays used to detect viruses. Each virus was extracted from the plaque assays and combined with concentrated host strain to obtain pure phage. Nineteen different bacterial cultures were isolated and ten appeared to host bacteriophage. The bacteria that were isolated were mostly gram negative bacilli. The colonies of the host strains exhibited a variety of pigments, shape and texture. Further characterization of the bacteriophages will include analysis of genetic material, and determination of their host range and replication strategy (either lytic or lysogenic).

SEA QUEEN

Rasmussen, Kortney
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

My fashion line, Bon Voyage, features the Sea Queen dress inspired by the sail boats off shore on Venice Beach in California. Sea Queen is a fun and flirty garment a young women would wear while walking the board walk. Inspired by a girl’s jumper, the dress has more of a childish, conservative front, but a sexy low cut back. My line follows a nautical, sailor theme with an edge of glam, using treasure details such as anchors for accents. This is one in a line of three garments; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in Milo Smith Theatre in McConnell Hall.
AN EVOLUTIONARY HISTORY OF THE TIPI THROUGH HISTORICAL PHOTOGRAPHS

Ratliff, Joel
Faculty Mentor(s): Kathleen Barlow, Anthropology and Museum Studies

This poster will focus on research that is being done for a larger project called “Cross Cultural Analysis of Tipi Structures in the Northern Plains: Among the Blackfeet, Crow, Northern Cheyenne, and Lakota Sioux.” Using an evolutionary history approach, one can see how the tipi has been used and adapted by many cultures over time as seen in three time periods. These are pre-contact, reservation and post reservation or contemporary period(s). First, tipis seen and described in the pre-contact period are important because they portray life as it was lived in cultural context. Second, during the reservation period, great strains were placed on the peoples and this became apparent in their cultural adaptations. Finally, during the post reservation period, contemporary tipis, which are being used around the world, show a wide array of forms and uses. The tipi is an important house form in the fact that it is an expression of culture, embodies worldview, and was a center of life for many groups. The contemporary commodification of the tipi, as well as much of Native American material culture, is epitomized in the book, The Indian Tipi, written in 1957 by Gladys and Reginald Laubin. The theme for this poster is historical photographs which show changes in form and function over time. This work draws heavily on ethnographic data, and other available literature on the subject. The images used will portray tipis as they were seen in context, as they were changed, and as they are today.

OF CHIMPANZEES, BONOBOS, NEANDERTALS AND HUMANS: USING MITOCHONDRIAL DNA VARIATION TO IDENTIFY SPECIES BOUNDARIES

Ream, Candance
Faculty Mentor(s): Joseph Lorenz, Anthropology and Museum Studies

Although the species concept is central to modern biology the definition of what constitutes a species has been difficult to apply uniformly across taxa. Most definitions invoke one or more of the following criteria: reproductive isolation, morphological similarity, biogeographical contiguity and phylogenetic continuity. These criteria, especially reproductive isolation, difficult enough to ascertain when comparing fossil forms to extant forms are not evenly applied when dealing with living forms. The use of an objective measure of similarity-dissimilarity among organisms would be one means of determining the appropriate taxonomic level to which they should be assigned.

In this study we compare whole mitochondrial DNA sequences from 30 mammalian species which vary from each other by various degrees of reproductive isolation in order to determine whether there is a “threshold” of genetic similarity below which two groups should be considered the same species.

CHINA’S WILD WEST: THE LAST ECONOMIC FRONTIER

Reddick, Jeremy; Bennett, John Paul; Cunningham, Samantha
Faculty Mentor(s): James Cook, History

In 1978, China’s open door policy created special economic zones to conduct significant amounts of trade. These zones were located on the coasts of China and caused great disparities to form between eastern and western China, as the coastal regions began to soar. Jiang Zemin delivered a proposal to the State Council on June 13th 1999 that outlined plans to ameliorate the disparities between eastern and western China, which is commonly known as the Great Western Development Strategy. Our research sought to determine whether the strategy has been effective or not, as information is vastly limited after 2004. We answered our research questions through on-site field research conducted in the western China provinces of Qinghai and Gansu in the summer of 2009. Funded by the National Science Foundation, this paper introduces our findings via regression analysis and graphs. We hypothesized the Great Western Development Strategy had narrowed the gaps between the two regions, but it had actually increased. We believed that investment in infrastructure has greatly improved the growth rate of western China and our research supported this belief. Finally, we believed increases in private sector activity stimulated growth, which was supported by our findings. As we learned in our research, education is a problem in much of China and is particularly poor in rural villages. Western villages lack qualified teachers, funds, and are often subject to embezzlement. Although the gaps have not narrowed yet, we believe the strategy has been effective and will narrow the gaps in time.
CWU STUDENTS’ ATTITUDES AND BEHAVIOR SURROUNDING SEXUAL HEALTH AND PREVENTIVE CARE
Reed, Morgan; Cordero, Christina; McDaniel, Jessica; Messier, Danielle
Faculty Mentor(s): Rebecca Pearson, Nutrition, Exercise and Health Sciences

41 (Afternoon Poster Session in Ballroom)

Existing literature suggests that there are significant issues with college students across the nation with regard to female students being proactive in preventive gynecological care and both female and male students being proactive about STI screenings. There seem to be several barriers for students that prevent them from seeking out the needed screenings. There have been multiple studies conducted a variety of ways to address college students’ failures to be responsible for their sexual health and preventive care. The purpose of this study was to specifically focus on Central Washington University (CWU) students’ behavior and beliefs towards their sexual practices and preventive sexual care. This study was conducted solely on CWU students with the intent to establish through a written survey the barriers that prevent students from seeking STI and PAP smears, their susceptibility belief, and the CWU students’ general sexual practices. The results of the study suggested that CWU students experience the same beliefs and behavior patterns as suggested in existing literature reviews. Since this survey’s findings are similar to other research findings, it is suggested that CWU continue to provide programs such as safer sex 101, educational literature, and counseling on safe sex practices and preventive care. CWU should further implement new programs that focus primarily on the importance of preventive sexual care and target the barriers that deter students from receiving preventive care.

INSTINCT BY DAVID MICHAEL
Reimer, David
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

My spring ’10 fashion line is entitled Instinct by David Michael. My line will consist of three different dresses including an empire-waisted style, halter mermaid style, and a strapless corseted piece. My inspiration lies in the fabric of zebra print, every woman, has an instinct, whether is be animalistic, demure, or of innocence. The them lies solely in the dresses with each print of zebra being differently placed on the gown. My design process consisted of draping out pattern pieces to make samples, then from there making samples to fit my models. After fit, I make them out of the fashion fabric. This is one of three garments in the line; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in the Milo Smith Theatre in McConnell Hall.

MAMA TOMCAT’S FLYING SCHOOL BY SPRING HERMANN: A COSTUME DESIGN BY LAURA M. REINSTATLER
Reinstatler, Laura
Faculty Mentor(s): Scott Robinson, Theatre Arts

41 (Afternoon Poster Session in Ballroom)

This touring production, with over 40 regional performances for youth-audiences, required all costumes, props, and sets, plus actors and stage manager, to fit into two vans. The costume design needed to reflect the director’s concept, describing the characters as whimsical anthropomorphic animals—clearly recognizable as humans in acting roles. A small cast of five actors played nine characters including five cats, two rats, and two seagulls, which meant doubling up on roles and quick costume changes. This design specified cat suits, constructed by a chenille process, to yield furry, cat-like colorations with a texture that would appeal to youth audiences and withstand cat-like fight choreography and actions. Role changes from protagonist cats to antagonist rats required clear delineation through costuming and acting styles and efficient off-stage metamorphoses.
THE CONSEQUENCES OF NORTH AND SOUTH
Rice, Rylee
Faculty Mentor(s): Therese Young, Nutrition, Exercise and Health Sciences

31 (Performance 1:50-2:30 in SURC Theatre)

My dance/movement project, The Consequences of North and South, was inspired by three things: a piece of local art, a poem by Larry J. Knight Jr., and my own personal experiences. All of which helped me create an integrated arts project for my Winter Choreography class taught by Therese Young. When I read Our Quiet Conflict by Knight, I immediately loved the imagery it created with its reference to the Civil War. Fought brother against brother, this event in American history really spoke to me through Knight’s words. I started choreographing by attempting to understand the differing sides of the most painful and personal arguments. My work is also influenced by a piece of art by Margaret A. Sahlstrand which was an intaglio embossed collage of a wedding dress. I left the gallery feeling that the picture represented a complicated and old-fashioned union. From there, I added my own personal touches. Two the dancers represent initial and silent conflict, using sharp and core-based movements. Another two dancers represent more outward conflict as well as attempting to push through it. I used more interactive and sustained movements with them. I believe I’ve created something very personal, yet relatable, and have enjoyed sharing my interpretations and feelings through the art of dance.

ANGELINA RICH
Rich, Angelina; Bakeman, Mary
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

For my garment I decided to make a floral romper/jumper. The overall inspiration of my garment was the natural scenery around Ellensburg. I took aspects from things from cattails (the plants) to dead shrubbery on the ground in parking lots. I translated this inspiration into a modern casual look that attributed my personal aesthetic. The garment process started by creating the bodice. I used darts to shape it to the body. I then created shorts using the same process. I then combined the two. This is one in a line of three garments; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in Milo Smith Theatre in McConnell hall

BLACK BEAN POWDER AS A NUTRITIONAL ADDITIVE TO A COMMERCIAL GLUTEN FREE BROWNIE MIX
Richardson, Kimberly; Shields, Margaret; Kangiser, Darrell
Faculty Mentor(s): David Gee, Nutrition, Exercise, & Health Sciences

41 (Afternoon Poster Session in Ballroom)

Gluten-free Namaste brownie mixture was supplemented with Vegefull’s Black Bean Powder to determine if black bean powder is an acceptable addition to gluten free brownies to improve fiber content; gluten free diets commonly lack fiber. Twelve gluten intolerant judges were given a randomized single blind test using the Namaste mixture as a control. Black bean powder was added to the brownie mixture, increasing fiber to a good source, 2.5 grams from 2 grams. The third batch contained three grams of fiber, increasing the control’s fiber content by 50%. Once subjective and objective data was collected, a mean, standard deviation, and Tukey’s LSD were calculated finding significant differences between the brownies. A duo-trio test between the three brownie variations resulted in nine of the 12 judges determining the difference between the control and the two other versions, showing no significant difference between the brownies (p>0.05). Subjective tests for tenderness, sweetness, and preference showed a significant difference between the brownies. The 50% more fiber brownies were significantly less tender, and preferred significantly less (p<0.05) than the other two. The control brownies were significantly sweeter (p<0.05) than the two variables. Objective tests for shear force and cone penetration force were done with the TA.XT2 texture analyzer and found significant differences between the variations. The control required the least shear force and the 50% more fiber brownies had the highest. The good source of fiber brownies had the lowest force necessary for cone penetration while the 50% more fiber brownies had the largest.
THOMAS MORE: AN ACCIDENTAL FEMINIST

Riley, Allison
Faculty Mentor(s): Laila Abdalla, English

27 (Oral Session 1:50-3:30 in 140)

Thomas More is a man trapped between two ages. As a devout Catholic, his obedience to his faith places him squarely in the Middle Ages; but as a humanist scholar, especially in his practice of female education, Thomas More's ideas illuminate the initial progressivism of the Early Modern period. In her article, “Thomas More's Feminism: To Reform or Re-form,” Judith Jones suggests that “[More's] dichotomous attitude towards women merely strengthens our image of him standing like a wobbly colossus with one foot set firmly in the Middle Ages and the other trying to find a stable spot in the modern world” (67). With this dichotomy of character in mind, it becomes apparent that Thomas More is not acting to further a feminist agenda. However, nor does he adhere to the chauvinistic standards of his peers regarding women, standards which, incidentally, his own practices help to ameliorate. Instead, Thomas More marks an evolution in the educational practices of humanist scholars because he restructures the hierarchy of female education; unlike his contemporaries, Erasmus and Vives, More's primary concern in educating females is the increased spiritual connection an educated woman can achieve with God. By examining the differing philosophies of his contemporaries, More's Utopian practices, his private letters and public epigrams, and finally the effects of the system of education he proposes, it is apparent that although More is not overtly feminist, his actions plant the seeds of progress for future generations.

EFFECTS OF TREE CHARACTERISTICS ON SLEEPING TREE CHOICE IN BORNEAN AGILE GIBBONS (HYLOBATES ALBIBARBIS)

Rinear, John; Sheeran, Lori; Susan, Cheyne
Faculty Mentor(s): Lori Sheeran, Anthropology and Museum Studies

36 (Oral Session 3:40-5:40 in 201)

Unlike other apes, hylobatids do not construct sleeping nests. Instead, these arboreal primates sleep in the forest canopy. Previous gibbon research indicates that certain aspects of tree morphology and interaction with surrounding flora can both positively and negatively affect the sleeping tree choices of Hylobates lar and H. klossi. We tested the hypotheses that 1) gibbons are selective about sleeping trees, and 2) gibbons prefer sleeping trees with characteristics that reduce chances of predation. From October 2005-September 2009 data were collected from H. albibarbis sleeping trees at the Natural Laboratory of Peat Swamp Forest, Sabangau Catchment, Central Kalimantan, Indonesia. We recorded dimensional measures and qualitative features for each sleeping tree (n=45) and for four surrounding control trees (n=180). We found that tree height is associated with tree selection (binary logistic regression, z=2.04, p=0.04). Gibbons appear to avoid trees with lianas (binary logistic regression, z=-1.75, p=0.08), and also avoid trees with predator access to the crown via neighboring trees (binary logistic regression, z=-1.96, p=0.05). Our results are consistent with previous findings that the gibbons prefer taller trees and those with fewer lianas. Our findings also underscore the importance of retaining large trees in mixed-swamp forest and give insight into the anti-predatory behavior of this gibbon species.
Tracking Dietary Variations Through $^{13}$C and $^{15}$N Isotope Analysis of Human Hair

Rinke, James; Stedham, Elizabeth; Rotman, Holly
Faculty Mentor(s): Carey Gazis, Geological Sciences

41 (Afternoon Poster Session in Ballroom)

Stable carbon and nitrogen isotopes from plant and animal products, which are consumed, become integrated into the consumer’s hair as it grows. Animals, C3 and C4 plants all have varying $\delta^{13}$C and $\delta^{15}$N signatures, therefore, different proportions of each incorporated into the diet produce distinct signatures of $\delta^{13}$C and $\delta^{15}$N stored in hair. In this study we analyzed several 72-cm long strands of human hair to determine if changes in diet are reflected in the isotopic signature of the hair. Using an Elemental Analyzer coupled with a Mass Spectrometer, long and short-term trends in the subject’s $\delta^{13}$C and $\delta^{15}$N consumption could be seen. Assuming a human hair growth rate of 1 cm/month, small increases in $\delta^{13}$C can be seen every 16 months. A gradual decrease in $\delta^{13}$C values begins approximately 44 months prior to sampling and continues to present. An overall decrease in $\delta^{15}$N is also noted. The 16-month increases in $\delta^{13}$C may be associated with seasonal diet changes, while the change in the overall trend of $\delta^{13}$C may be attributed to the partial removal of the C4 plant corn from the subject’s diet. Alternatively, some of the observed trends could be due to changes in the subject’s metabolism over the last four years. This study shows that stable isotope analyses of human hair can be used to identify long and short-term changes in diet.

$C_{60}$ Has Opposing Dose-Dependent Effects on Electron Transport Chain Function and Oxidative Stress in Isolated Bovine Heart Mitochondria

Rosario, Sara; Thomas, Carin
Faculty Mentor(s): Carin Thomas, Chemistry

40 (Morning Poster Session in Ballroom)

$C_{60}$ is a carbon nanoparticle that has been investigated in many biomedical applications. After decades of research, however, its biological effects remain controversial. This may be due in part to the methods used to solubilize $C_{60}$ in water. In this study we examined the effects of $C_{60}$ solubilized in 7.5% bovine serum albumin on isolated bovine heart mitochondrial function. The aims were to determine the dose-dependent and time-dependent effects of $C_{60}$ on mitochondrial electron transport chain function and oxidative stress. To assess electron transport, succinate oxidase activity was measured by oxygen consumption after exposure to 2 - 35 ppm $C_{60}$ for time points up to 30 minutes. Hydrogen peroxide production and lipid peroxidation were measured as indicators of oxidative stress. The ability of $C_{60}$ to produce reactive oxygen species (ROS) in the presence of physiological reductants (succinate, ascorbate and NADH) was also measured. The results show that 2 ppm $C_{60}$ caused a surprising 50% increase in electron transport chain function at all time points as compared to controls, and no oxidative stress. However, higher concentrations of $C_{60}$ (10 & 35 ppm) caused approximately 20-30% electron transport chain inhibition at all times points except zero. Hydrogen peroxide production was observed only at the highest concentration tested. Lipid peroxidation was observed at all times points. The physiological reductants did not produce significant amounts of ROS in $C_{60}$ solutions. It is hypothesized that $C_{60}$'s effects are due to its dissolution in the membrane which causes physical disruption of electron transport chain components.
INCREASING TEACHERS’ SENSITIVITY TO THEIR MUSLIM STUDENTS

Ross, Molly; Nizamani, Fara
Department: Education

32 (Oral Session 3:40-5:40 in 135)

This article examines the Five Pillars of Islam and how each may affect the curricular decisions public school teachers must make in order to effectively serve America’s rapidly increasing Muslim student population. Unlike other affected minorities, Muslim students’ Islamic religion is just that, a religion, whose student/followers can represent different races, coming from varying countries, speaking varied languages, calling for a closer look at how educators react sensitively to their special needs. Well intentioned teachers “may inadvertently say and do things that are inappropriate at best and extremely offensive at worst” (Nizamani, 2005, p. 10). Few teacher preparation programs, however, include teaching educational strategies aimed at helping the increasing population of Muslim students now numbering several hundred thousand in American public schools. The Five Pillars comprise the basic tenets of Islam. From these principles, all philosophy and behaviors are derived. They are Shahada, Salat, Sawm, Zakat and Hajj. Shahada is a belief in one God and His messengers; Salat is prayer five times a day at appointed intervals dependent on the lunar calendar; Sawm is fasting during the holy month of Ramadan; Zakat is charity for those in need; and Hajj is the pilgrimage to Mecca for those who are able. These principles obviously affect all of a Muslim student’s daily life. Learning about these principles will enable teachers to understand more fully the why and how so appropriate accommodations can be made to help their Muslim students become more successful.

FLUID BUDGET OF METASEDIMENTARY ROCKS ON THE OLYMPIC PENINSULA AND CONNECTIONS TO SEISMICITY: GEOCHEMICAL, PETROGRAPHIC, AND ISOTOPIC INSIGHTS

Rotman, Holly; Mattinson, Chris
Faculty Mentor(s): Chris Mattinson, Geological Sciences

1 (Oral Session 8:00-9:20 in 135)

Fluid movement in accretionary prisms has been linked to the recently discovered episodic tremor and slip (ETS) earthquake events along subduction zones, but prior studies lack the detail to effectively test the hypothesis that fluid flow triggers ETS events. I conducted field work along a 52-km transect on the Olympic Peninsula accretionary prism of the Cascadia subduction zone, and collected approximately 40 representative samples of sandstone and shale that were buried to 6-15 km, which intersects the 10-50 km depth range of ETS events. Based on my observed mineral abundances combined with the known water content of each mineral, a metasandstone buried to 7 km contains 1.6% water, or 44 kg/m$^3$. Some rocks locally contain quartz veins formed from fluid that passed through the rocks during burial. The +11 to +16‰ oxygen isotope values of the veins are very different from surface water values, and are consistent with the hypothesis that the vein-forming water originated in sedimentary rocks at ETS depths. Based on established quartz solubility values at 200˚ C and 4 kbar, 1 m$^3$ of rock with 1% quartz veins records the former flow of 1000 kg of water. My preliminary results support the hypothesis that water is released at adequate depth and quantity to trigger ETS events, so my results could be used to improve the spatial resolution of future studies in similar settings worldwide by geologists and geophysicists to better understand the causes and processes of ETS events.

THE OTHER GOLD STANDARD: A LITERARY EXPLORATION OF HUMAN MONETARY VALUE

Sanford, Janna
Faculty Mentor(s): Laila Abdalla, English; Steve Olson, English; Christine Sutphin, English; Gerry Stacy, English

27 (Oral Session 1:50-3:30 in 140)

The study of literature is one of the most telling methods to reveal the evolution of human thought. It is not only critical to understanding more concrete changes throughout history but also, and perhaps most importantly, the evolutionary nature of ideas. This paper will explore the concept of “human monetary value” within literature, with a linear study of the idea’s progress throughout history. What began as a blatant system of assigning value to an individual based on wealth and social class has changed over time, but it has not disappeared. I will focus particularly on the legal system of the United States. As it evolved from the British system, I will be utilizing a variety of both British and American texts to illustrate my claim. Through this textual analysis, I will show not only the longevity of the connection between social class and social value in culture and literature, but also demonstrate how this relationship impacts the functionality of a justice system.
THE STRENGTH OF A SMILE: THE EFFECT OF DUCHENNE SMILES ON CONSUMER PERCEPTIONS OF ADVERTISEMENTS

Scanlon, Anne; Polage, Danielle
Faculty Mentor(s): Danielle Polage, Psychology

CWU-Des Moines Poster Session

The effects of type of smile displayed in mock print advertisements were examined. Participants rated pairs of self-created advertisements. Participants significantly preferred to view Duchenne smiling advertisements over non Duchenne. Participants also showed significant preference in their likelihood to purchase products featured in Duchenne advertisements over non Duchenne. Results indicate marketers may benefit from including models displaying Duchenne smiles in their advertisements. Implications also exist for social psychology.

MARKETING AND PROMOTIONAL ACTIVITIES OF THE UNITED STATES BEER INDUSTRY IN IRELAND

Schoeler, Michael
Faculty Mentor(s): Hideki Takei, Information Technology & Administrative Management

21 (Oral Session 12:00-1:40 in 301)

This research project takes a look at the US beer industries’ retail and promotional influence on the buying decisions of Ireland consumers. Especially, I focus on both marketing programs and promotion programs of the US beer industries in the Ireland beer market. I also focus on cultural influence in beer drinking, therefore, consuming behaviors of beer in Irish market in order to see how the US beer industries take such cultural influence into account when they develop their marketing and promotion programs. There are two presumptions that I made based on my learning in the International Retailing class. First, I assume that US beer company, especially, Budweiser, with well known brand name should position itself on the premium imported beer in the Irish market. Second, I assume that the company’s market strategy should focus on the brand position, image, and recognition in order to not only promote the beer but also ensure distribution networks in the market. This research uses intensive literature review in order to have sufficient data about marketing and promotion programs, consumer behaviors, and cultural influences in Irish beer market. Basic statistical analysis can be used in order to quantify my results. Finally, I will take comparative study approach to make differences in marketing and promotion between USA and Ireland so clear. Possibly important data are consumer price index, exchange rate, income per capita, market size, competitors, beer consumptions and productions, beer distribution networks, and sales trends in both US and Irish markets.

CHARACTERIZATION OF PHYTOCHEMICALS ISOLATED FROM DALEA FORMOSA (FABACEAE) FOR COMBATTING FUNGAL MULTIDRUG RESISTANCE

Schreiber, John; Eisenberg, Victoria; Kolaczkowski, Marcin
Faculty Mentor(s): Gil Belofsky, Chemistry

37 (Oral Session 3:40-5:40 in 202)

Dalea formosa (Fabaceae), a plant native to Arizona was screened for phytochemicals of medicinal interest. Specifically, compounds are sought with direct antifungal activity toward Candida and Saccharomyces spp. as well as those that inhibit fungal ABC transporters that are, in large part, responsible for the development of multidrug resistance. The crude methanolic extract of D. formosa produced positive results as both a fungal efflux pump inhibitor and as a direct antifungal in preliminary biological testing. Successive chromatographic fractionation produced several known pure compounds that were identified as flavonoids, specifically quercetin, methoxyquercetin and dihydroquercetin, by 1H and 13C NMR spectroscopy, and by mass spectrometry. Further testing revealed the methoxyquercetin to have marginal direct activity (minimum inhibitory concentration, MIC = 61 μg/mL) against Candida glabrata. Several fractions of varying purity exhibit the potential to contain previously undiscovered compounds. Some of these include materials from a separate extract of the roots of the plant that have more potent activity (MICs < 15 μg/mL) against a range of fungal strains. Ultimately, new compounds with unique biological activity may be isolated, possibly leading to new drugs and a more thorough understanding of fungal multidrug resistance.
THE EFFECT OF CaN ON AXON GROWTH IN THE CHICKEN EMBRYO

Schultz, Kaytlyn; Davis, Jesse; Godinez, Maria; Selski, Dan
Faculty Mentor(s): Daniel Selski, Biological Sciences

40 (Morning Poster Session in Ballroom)

Our research analyzes axon growth and axon interaction with their targets in developing chick embryos. We were specifically looking at the retinotectal system, measuring axon growth from the retina to the optic fiber layer of the tectum. The intracellular protein Calcineurin (CaN) is important in the development of immune cells and mediates signals from cell-surface receptors in developing neural systems. It is our hypothesis that the inhibition of CaN function will lead to fewer axonal connections between the retina and the tectum of growing chick embryos. CaN inhibitors were used to block intracellular signals from certain receptors on the surface of retinal axons during the stage when axons are finding and recognizing their target. We then compared axon growth of the CaN inhibited axons to the axon growth of controls that were not treated with the inhibitor. By injecting a fluorescent dye into the eye of the chick embryos, when axons have normally reached their target, we were able to visualize axon growth. Under a fluorescence microscope, both retinal and tectal axons have been detected in the chick embryos. In particular, we have been comparing the amount of fluorescently labeled axons in the retina to those seen in the tectum. With this we showed that inhibition of CaN expression led to fewer axonal connections between the retina and the tectum of the developing chick embryo. With larger numbers of replicates, it will be possible to more accurately quantify the amount of axons within a given area of the tectum.

TOURIST DENSITY AND INFANT-DIRECTED AGGRESSION IN TIBETAN MACAQUES (MACACA THIBETANA) AT MT. HUANGSHAN, CHINA

Self, Sydney; Matheson, Megan; Li, Jin Hua; Harding, Sarah; Pelton, Oland; Wagner, Steven
Faculty Mentor(s): Lori Sheeran, Other

36 (Oral Session 3:40-5:40 in 201)

Berman, Ionica, Li, Ogawa, and Yin (2007) demonstrated impacts different ecotourism management methods had on annual infant mortality rates in a group of habituated Tibetan macaques (Macaca thibetana) at Mt. Huangshan, China. We further explored the contribution of one aspect of ecotourism management (tourist density) at the same site in an 8 week study, focusing on rates of infant-directed aggression (IDA) instead of annual mortality. We hypothesized that both tourist density and proximity would be positively correlated with IDA frequencies. We collected demographic information on perpetrators of IDA and predicted that adult males would engage in IDA more frequently than adult females or juveniles. Subjects consisted of 5 adult males, 7 adult females, 16 juveniles, and 5 infants. Tourist density was measured by scan samples every 6 minutes and averaged across the sample to correlate with any occurring IDA. IDA frequencies were recorded during 2 minute infant focal samples. The distribution of aggressors differed significantly from chance [$\chi^2(2, n=63) = 62.88, p<0.01$], with adult males accounting for 54% of attacks. Among adult males, the distribution of IDA differed significantly from chance [$\chi^2(4, n=34) = 36.88, p<0.01$], with the alpha male accounting for 58% of adult-male-to-infant aggression and 20% of total cases of IDA. Additionally, particular IDA behaviors were associated with specific ages/sexes. No significant correlation was found between total tourist density and IDA frequency, supporting Berman et al.’ findings. However, there was a significant relationship between the quadrat location of IDA occurrences and their proximity to tourist platforms [$\chi^2(5, n=52) = 15.91, p<0.05$].

AN INVESTIGATION OF UNIVERSITY STUDENTS’ GROCERY STORE PREFERENCES AND VARIABLES WHICH AFFECT THOSE PREFERENCES

Sewell, Katelyn; Biggs, Amanda
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

30 (Oral Session 1:50-3:30 in 301)

This research study investigated Central Washington University students’ shopping preference of local grocery stores and the variables which affect their consumer behavior decision making process when choosing a grocery retailer. The main hypothesis was that the majority of students have one top preference of store choice based on location, ambiance, and special offerings. Findings and their implications will be presented in this session.
Wolf at the Door
Andrew Shanks
Faculty Mentor(s): Elise Forier, Theatre Arts; Michael Smith, Theatre Arts

39 (Performance 3:40-5:20 in SURC Theatre)

Wolf at the Door, an award winning short play written by Andrew Shanks, is the story about the lengths to which we are willing to go to be free. The play unfolds in the aftermath of a bloody confrontation. Lilly, a weary and worn young wife, has just committed the most violent of deeds but her depths into madness are just beginning as she’s battered by the presence of her husband, the titular Wolf. What happens next is a woman’s struggle to break free from a violent cycle of abuse. Wolf at the Door premiered at the Betty Evans One Act Festival in February 2010. It was directed by CWU student Jeff Carpenter with the following cast: Lilly - Tamara Helland, Wolf - Jared Morgan. Wolf at the Door was recently nominated as a Regional Finalist for the Kennedy Center American College Theatre Festival in Reno, NV.

Site 45KT301: A Review of Investigations, Analysis of Projectile Points and Exploration of the Site’s Research Potential
Holly Shea
Faculty Mentor(s): Patrick Lubinski, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

Site 45KT301 near Ellensburg, Washington, represents part of a large gathering ground used for centuries by Native American groups on the Columbia Plateau. The study in progress includes a synthesis of research done on the site, an assessment of the site’s NRHP eligibility as well as the examination of more than 300 projectile points recovered from the site. The projectile point analysis will include use of metrics and Carter’s 2002 dichotomous key to assign point type as well as description of certain attributes of the points. I hypothesize that the collection will show a broad time range with heavy focus on the late Prehistoric period and extensive use of local raw materials. The study will determine the research potential inherent in the site’s artifacts and will establish the site’s significance to Plateau archaeology and history.

Age and Sociability in Free-living Tibetan Macaques
Lori Sheeran; Megan Matheson; Jinhua Li; Steve Wagner
Departments: Anthropology and Museum Studies; Biological Sciences

36 (Oral Session 3:40-5:40 in 201)

Primate aging has relevance for human aging, but fieldwork is hampered by few populations with numerous old animals. Tibetan macaques in Huangshan, China provide an opportunity to study female aging. We tested two hypotheses of social isolation: older adult females are less likely to be involved in grooming bouts and are in proximity to fewer individuals than are younger adult females. We collected data during August 2008, 2009. We conducted 5-minute focal samples of all adult females and recorded the grooming initiated/received by the focal and her grooming partner’s identity. We recorded identifies/age class of monkeys in proximity to the focal animal at 30-second scans within the focal. We found no difference among adult females, regardless of age, in grooming received/given (2009: $\chi^2=8.18$, df 8, p=0.41; 2008: $\chi^2=10.57$, df 7, p=0.16). Adult females groomed more with adult females than with adult males, juveniles, or infants (2009: $\chi^2=13.25$, df 3, p=0.0041; 2008: $\chi^2=40.5$, df 3, p<0.0001). We found no difference in the average number of individuals old (>20 yr), middle-aged (12-20 yr), and young (<12 yr) females were proximate to (One-Way ANOVA, df 2; 2009: F=0.26, p=0.7791; 2008: F=1.98, p=0.2326). However, in both years individual adult females were proximate to particular individuals or age classes, most often their dependent juveniles or infants. Our grooming and proximity data indicate that older adult females are as sociable as are younger females. The presence of kin, particularly immature offspring, in the group with whom to affiliate appears to ensure sociability independent of age.
ALL TIED UP
Shipler, Jessie
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

23 (Fashion Show 12:00 outside Wildcat Shop) and 41 (Afternoon Poster Session in Ballroom)

My garment creation, All Tied Up, is inspired by the lifestyles that women around me lead. Most of us are always wrapped up or tied up in something that makes focusing on ourselves and relaxing difficult. This garment is a play on that, it has ties that wrap around the body (so the woman is still “tied up”), but at the same time makes the woman wearing it feel great about herself. To begin my design process I started sketching and then from my sketches I draped fabric on a mannequin to create the shape of my dress. From there I created paper patterns and a sample garment. After fitting my sample garment to my model, I created the final garment. This is one in a line of three garments; the entire line can be seen at the Fashion Merchandising spring fashion show, Fashion Oddity, May 22 at 7 p.m. in Milo Smith Theatre in McConnell Hall.

LIGAND EFFECTS ON THE STRUCTURES AND ENERGIES OF SILICON NANoclUSTERS
Shore, Thomas; Ge, Yingbin
Faculty Mentor(s): Yingbin Ge, Chemistry

37 (Oral Session 3:40-5:40 in 202)

Silicon nanoclusters exhibit a bright photoluminescence in the visible spectrum. Due to their wavelength tunability, resistance to photobleaching, small size and biocompatibility, silicon nanoclusters are perfect candidates for cellular imaging. Most of the theoretical investigations on the luminescence of silicon nanoclusters wrongfully assume the diamond-lattice like structure is always adopted as in bulk silicon. In bulk silicon, the diamond-lattice structure is preferred because it is constructed only by 6-membered rings which have the minimal ring strain. However, we have found the structures of silicon nanoclusters prominently depend on the surface ligands due to their much larger surface-volume ratio. To better understand the ligand effects, 14 Si\textsubscript{7}L\textsubscript{14} and 22 Si\textsubscript{10}L\textsubscript{16} structures were optimized using the B3LYP density functional method, where L stands for ligand. Silicon nanoclusters passivated with fluorine, hydroxyl groups, and amino groups preferred structures containing 3 and 4-membered rings rather than 6-membered rings. The electronegativity of the ligand plays a key role in determining the relative energies of each structure. Hydrogen bonding is observed in the silicon nanoclusters passivated with hydroxyl and amino groups, which also alters the energy ranking significantly. Our research raises the awareness that the energies of silicon nanoclusters do not only depend on the ring strain, but also on the electronegativity of the ligands and the hydrogen bonding between the ligands. Thus, all of the three factors mentioned above should be taken into account in the theoretical investigation on the structures, energies, and consequently the mechanism of the luminescence of silicon nanoclusters.

MEMBER RETURNED MAIL PROCESS
Smith, Rick; Starr, Teresa; Haghi, Saba
Faculty Mentor(s): Kun Liao, Finance & OSC

CWU-Lynnwood Poster Session

Currently there is a large quantity of mail that is returned to Premera Blue Cross for two reasons. The outgoing mail is addressed in the wrong format or has an outdated address and cannot be delivered. Due to the high volumes of mail being returned, PBC is subject to USPS fines and penalties. The bulk of this mail is member’s explanation of benefits or EOB’s, but is not limited to this correspondence and can be from many different departments within Premera. At this time there is no standard procedure for researching and updating the address. To eliminate and reduce the amount of returned mail we will research possible process controls and determine the most efficient way to correct the bad addresses once mail is returned. One possible control will check for bad address on the front end when addresses are entered and send notification to the employer group. This automated process will cut down on the lag time of manually sending notification once the mail is returned as undeliverable. Second, we will research a process to flag the system when a bad address is identified so no further mail will be sent out until the address is updated. Next, we will observe and time how the different departments are resolving the bad address in order to standardize and create a process for all departments to use.
DROUGHT-INDUCED FREEZE TOLERANCE IN RADISH (RAPHANUS SATIVUS) SEEDLINGS
Sotelo, Emily
Faculty Mentor(s): Tom Cottrell, Biological Sciences; Jason Irwin, Biological Sciences

40 (Morning Poster Session in Ballroom)

Desiccation stress triggers an internal mechanism of freeze tolerance similar to that of frost induced hardening in some plant species. Accelerated cold hardening plays an important role in where and when certain crop varieties can be grown, affecting growth seasons and productivities. It has been shown in some winter crop species that drought induced stress triggers signal pathways that induce the upregulation of cold acclimation genes. As a result changes in lipid composition in the plasma membrane and the accumulation of sucrose and other simple sugars increase membrane fluidity and intracellular solute concentration, protecting the plant from intracellular freezing and death. Comparing the relative growth and cellular recovery of droughted vs. imbibed Radish (Raphanus sativus) seedlings, groups were subjected to 24 hr drought (40% R.H.) and were exposed to gradual freezing temperatures (0.11˚C/min from 20.0˚C to -15.0˚C over 300 min). Both groups were greened and evaluated visually for vigor and by dry weight for recovery. Droughted seedlings showed greater net recovery and less cellular damage that imbibed groups; implying drought as a plausible method for inducing frost hardiness in radish varieties.

A BETTER CHANCE FOR LEARNING
Spalti, Erica
Faculty Mentor(s): Lisa Norris, English

41 (Afternoon Poster Session in Ballroom)

The majority of my research came from my own experience as well as personal research I did in my home town of Maple Valley Washington. The current data I have is from a second grade classroom, where 63% of the students had challenges in reading and writing. According to a survey done by the superintendent of my home town, 63% of students in a second grade classroom one elementary school had special needs; including learning disabilities and emotional problems. Since these special needs students have different learning styles from others, it is difficult to teach them in the same classroom as other students who learn at a regular pace and style. The majority of teachers surveyed said they did not have a good enough lesson plan available to them. To solve this problem, I propose to create a lesson plan that benefits the whole classroom. Since this is a topic I feel strongly about, given my connection to students needing extra help, I am devising a lesson plan that is fun and interactive for all students. I am in the process of asking permission from the Ellensburg School District to conduct research and present my lesson plan to a teacher in the district to see if it proves affective. Many people think that students with special needs are a lost cause. However, these special students just need different learning methods and someone to make them feel like they are not different than the rest of their friends.

MEANINGFUL CONNECTIONS: USING INTERGENERATIONAL SERVICE-LEARNING TO PROMOTE POSITIVE PERCEPTIONS ABOUT OLDER ADULTS
Spencer, Adrian; Ingram, Christina
Faculty Mentor(s): Jeff Penick, Psychology

41 (Afternoon Poster Session in Ballroom)

This paper adds to the ongoing evaluation of the Meaningful Connections program, an intergenerational service-learning program that brings college students and older adults together for small group discussions. Attitudinal changes for student participants (n = 45) were compared using pre- and posttest data from the Aging Semantic Differential Scale and Community Service Attitudes Scale. Two additional factors, site location (community center vs. assisted living) and reason for participating (class requirement vs. volunteer), were examined to account for potential variations between participants. Results indicated that positive attitudes towards older adults increased significantly at posttest. No significant changes were witnessed for attitudes towards community service. No significant differences were found between participants for either program site or reason for participating. These findings suggest that the Meaningful Connections program has a positive impact on student attitudes towards older adults regardless of site or reason for participating.
**DOG SEES GOD: IDENTITY THEMES**  
*Stahl, Kathryn*  
*Faculty Mentor(s): Elise Forier, Theatre Arts*

39 (Performance 3:40-5:20 in SURC Theatre)

Have you ever wondered what “group” you fit best with? Why you’re always sad? Why you stare a little too long at someone of the same sex? Do you want to know why the ugly kids get in the way? How girls can be so mean? Have you ever thought how you would act differently to people after hearing about a school shooting? Have you really acted differently? Do you regret not reaching a hand out in friendship, because if you had, he wouldn’t have killed himself? We all have an identity that is put on us by the things we do, good and bad. It is what makes us who we are, and yet, we are always transforming ourselves to cover it up. In the play *Dog Sees God: Confessions of a Teenage Blockhead*, author Bert V. Royal takes familiar characters and places them in a modern day high school. Charles Shultz’s *Peanuts* gang is all grown up and fighting to find out who they really are. These characters battle through rape, drugs, bullying, sickness, sex, homosexuality, transformation, pregnancy, and death, topics that hit every human being on one or more levels. Who are you? What is your identity? Because when it comes down to it, “Us defines Us”. All you need to do is “maintain in your heart all that makes you who you are” to open your eyes and see yourself through the clouds that follow you.

**IMPLEMENTING TOTAL QUALITY MANAGEMENT IN A SMALL BUSINESS**  
*Stevens, Mark; Dahl, Alexander*  
*Faculty Mentor(s): Kun Liao, Finance & OSC*

CWU-Lynnwood Poster Session

The project will discuss the continuous improvement and total quality management of a local small business. By incorporating the Six Sigma system popularized by General Electric’s Jack Welch, the poster will explore how operations can be improved on a variety of business activities. Quality assurance programs can create more efficiency and cost savings in the traditional areas of manufacturing, inspection, and distribution. Statistical analysis of data from the design to inspection process will be employed to create the smallest amount of defects possible, less than 3.4 out of 1,000,000. This low error rate ensures quality for all the products produced. However, Six Sigma can also be applied to broad aspects of a business from human resources to marketing and sales, and even in customer service. A total quality management system continually examines all operations to build the best organization possible. These processes can be used in the service industry as well. The analysis will show how a real-world example of quality assurance systems can be work used in any small business.

**RELIGION IN ICONOGRAPHY AND THEME IN THE HORROR PICTURE**  
*Stoops, Scott*  
*Faculty Mentor(s): Steven Olson, English*

3 (Oral Session 8:00-9:20 in 137B)

Horror is a genre that is not easily pinned down by one certain trait or one type of style - the horror film can be set at any time, in any location, and use a variety of filming styles as well as themes. However, one convention of the genre that remains relatively constant throughout is the presence of religion, whether in the iconography of a picture that features cross-wielding heroes or bible-thumping heroines or in the theme of the film. In this paper I will discuss the conventions of the horror genre that deal with religion as well as discuss why religion is used in so many horror films and why it is a crucial, and possibly inherent, piece of the genre.
WHO IS THAT GIRL WE SEE? WESTERN IDENTITY AND TELEOLOGICAL JOURNEY IN DISNEY’S MULAN

Strom, Christopher
Faculty Mentor(s): Liahna Armstrong, English

3 (Oral Session 8:00-9:20 in 137B)

Within the film Mulan (1998), there are two thematic thrusts: a Westernized version of an Eastern tale and a struggle of gender identity. In his book Orientalism, Edward Said asserts that “ideas, cultures, and histories cannot seriously be understood or studied without their force, or ... configuration of power, also being studied.” In other words, by re-making, and perhaps most importantly, expanding upon the original story, Western cinema has exerted its power over the East, creating a “Western gaze.” The main vehicle of Westernization in Mulan comes from Mulan’s infamous struggle with gender identity—both complicated and reaffirmed by theorist Judith Butler—which is best illustrated through the main song sequences in the film, keeping with Disney’s unique style. Mulan embarks on a teleological journey to discover her true gender identity, a plot device that is quintessentially Western. By analyzing Mulan’s use of gender crisis and Western narrative structure, I will work to not only validate my larger argument about Hollywood cinema’s Westernization of the East, but also to move beyond in order to understand how Disney’s protagonist becomes more of a hybrid, unable to be identified as purely Western or Eastern. Because Mulan is the Westernized half to her Eastern roots, the film enables a yin-yang construction to occur in her identity, bringing peace to a tale almost as old as China itself.

CRUSTAL THICKNESS OF THE MARIE BYRD LAND DOME AND ITS IMPLICATIONS

Svaldi, Josh
Faculty Mentor(s): Audrey Huerta, Geological Sciences

1 (Oral Session 8:00-9:20 in 135)

This study focuses on determining the crustal thickness of the Marie Byrd Land Dome (MBLD) in West Antarctica, which is a region of high elevation. Theoretical calculations based on the high elevation yield an expected crustal thickness of ~33 km. Our aim is to use seismic techniques to determine if the actual thickness of the crust matches the theoretical thickness. If the thickness of the MBLD crust is significantly different than the theoretical thickness, then we can assume that another mechanism is responsible for the high topography. Crustal thickness was determined by analyzing seismic waves from distant earthquakes and calculating the time it took for the waves to travel through the crust. Based on these analyses, we calculated crustal thickness values ranging from 28-31 km at the Mt. Patterson seismic station. This range of crustal thicknesses is significantly thinner than the theoretical thickness. In addition to determining the thickness of the crust, we also use the seismic analysis to estimate the crustal composition. Two different seismic waves, p-waves and s-waves, travel at different velocities within the crust, and the ratio of their velocities (Vp/Vs) can be used to identify local rock compositions. The ratio has revealed compositions similar to granite and andesite, a typical composition for crustal rocks. These results suggest that the high elevation of the MBLD must be partially supported by hotter-than-normal mantle beneath the crust. This hotter-than-normal mantle may indicate the presence of a mantle plume, consistent with the active volcanism observed in the MBLD.

AN EXPERIMENTAL TEST FOR THE HYBRID EDUCATION MODEL FOR INTRODUCTORY BUSINESS COURSES AT SMALL LIBERAL ARTS INSTITUTIONS

Takei, Hideki; Trumpy, Robert; Wang, Fen
Department: Information Technology & Administrative Management

21 (Oral Session 12:00-1:40 in 301)

The Hybrid Education Model (HEM) was developed and discussed by Takei (2008). He described the model as a “department store,” or “smorgasbord,” where instructors can pick elements for classroom use and potentially create his or her own model within an HEM framework. In this current study, the authors’ goals are to test (1) if HEM could serve as a department store for lecturers, and (2) if a rebuilt model could perform effectively in both education and mentoring during introductory marketing or business courses, at a small liberal arts college. While results were positive, the findings exposed several practical difficulties in both out-of-class workshops, and cross-disciplinary team activities. Therefore, instructors are advised to develop distinct processes in creating personal-level communications in class. They should also monitor cross-disciplinary team activities to assess student levels of enjoyment and learning, through the team activities.
ENdERGY CONVERSION EFFICIENCY OF SOLAR POWER IN A CWU RESIDENCE HALL  
Taylor, Robert  
Faculty Mentor(s): Michael Braunstein, Physics  

2 (Oral Session 8:00-9:20 in 137A)  
The need for energy independence and sustainability has prompted a transition towards green sources of energy. Photovoltaic (PV) solar power technology utilizes sunlight to produce power in the form of electrical potential energy. In turn, this power is converted from the PV array into another form of power for various applications. We have assembled a PV energy system in a CWU residence hall to determine the efficiency of converting the power from the PV array to end-use power. This PV array produces voltage at about twenty volts DC when under direct sunlight. The PV energy system converts this to charge a battery pack using a charge controller before inverting the power to utility grade 120VAC at 60 cycles. We have measured the DC power from the PV array using a Watts Up RC and the AC power with a Watts Up PRO connected to a constant load to determine the efficiency of the energy conversion in this PV energy system.

GENERAL MOTORS  
Tee, Ryan; Gonawan, Lukas; Yang, GuoMing  
Faculty Mentor(s): Kun Liao, Finance & OSC  

CWU-Lynnwood Poster Session  
General Motors was founded on September 16, 1908, in Flint, Michigan, as a holding company for Buick, then controlled by William C. Durant. In 2008 alone, GM sold 8.35 million cars and trucks globally. China is GM’s second biggest market after the United States. GM was the biggest car manufacturer in the world for the last couple of years, but last year, 2009, Toyota (Japanese car manufacturer) has replaced GM to be the biggest car manufacturer in world. Why would this happen? The main reason is Toyota traded Quality for Quantity. Quality is the biggest issue that makes Toyota seek to be No. 1 in the world. For example, GM does not manufacture small vehicles where the current market is demanding it most. They also did not spend enough time on “Green Cars” like hybrid cars. In this project, we will do research and comparison on two car manufacturers, GM and Toyota, especially on their manufacturing process. We hope by doing this, we will know why GM is losing the competition to Toyota in quality of their cars. We will compare the quality of their product in a couple of different ways, for example, safety, “green,” better driving experience, interior-and-exterior quality of cars that customers will most enjoy.

WOLLSTONECRAFT AND ORIENTALISM: AN IMPORTANT FLAW IN THE WORK OF A FEMINIST PIONEER  
Thomas, Nathan  
Faculty Mentor(s): Mathew Manweller, Douglas Honors College  

34 (Oral Session 3:40-5:40 in 137B)  
Mary Wollstonecraft, a late-eighteenth century mother of the feminist movement, errs in her Vindication of the Rights of Woman. Her words are far from perfect. Though Wollstonecraft helped to begin the slow change in treatment and knowledge of women in the Western world, she is guilty of many of the same crimes with which she charges men. She is a racist, regarding certain human beings as worth less than herself. Wollstonecraft is guilty of the same practices of ill treatment and faulty reasoning that she seeks to eradicate from the speech and behavior of men toward women. Wollstonecraft’s weakness in these terms is in her failure to do what she asks of mankind. Her mission is to free European women from certain injustices, yet she falters in that her own arguments subjugate certain races to similar injustices.
THE CULTURAL ERASURE OF INDIA IN TWO ANGLO-INDIAN GHOST STORIES
Tonnemaker, Heather
Faculty Mentor(s): Christine Sutphin, English

10 (Oral Session 9:30-10:50 in 140)

Distinguishing specifically how Victorian literature reflects its audiences’ anxieties and attitudes concerning colonialism is a considerable task. Britain’s dominance in India reached its peak in the nineteenth century, yet critics have often found the representation of empire marginal in Victorian literature. This marginality may in itself be significant, as critics have begun to examine colonial anxieties by reading from the margins. Such a reading of two Anglo-Indian ghost stories, Rudyard Kipling’s “At the End of the Passage” and Bithia Mae Croker’s “To Let,” reveals the impact of imperial occupation on India’s identity as well as Britain’s overall attitude on its imperial role. By participating in the imperial agenda, the characters of Kipling’s and Croker’s stories project cultural mores and practices on the land and peoples of India, thereby erasing and silencing Indian identity for the larger audience of British readers. Examining the empire’s cultural erasure of India via the negative depiction of Indian climate, the importance placed upon capitalist commodities, and the damaging portrayal of Indians reveals how these stories are emblematic of the Empire’s haunting effect.

TULLY’S COFFEE CORPORATION
Tran, Thinh
Faculty Mentor(s): Kun Liao, Finance & OSC

CWU-Lynnwood Poster Session

Tully’s Coffee Corporation “roasts and sells high quality, premium roasted whole bean coffee,” in addition to hot and cold beverages such as teas and sweetened ice cream, coffee related supplies, pastries, accessories and equipment. Founded in 1992 by Tom Tully O’Keefe in Seattle, Washington, Tully retail store philosophy focuses on providing an upscale atmosphere, with quick, friendly service where customers can relax and enjoy some of the finest hot and cold coffee, espresso, and hand-made ice cream shake drinks available, together with other tasty treats. Founded to primarily challenge Starbucks; however, challenging Starbucks proved to be hard and for fourteen years Tully’s was unable to make yearly profits only becoming profitable in 2006, posting a $15.4 million profit after selling overseas assets. Tully’s current situation is peppered with problems. With the severe recession customer spending has fallen in particular with high end coffee drinks. More consumers are shifting towards making coffee at home, which is causing the retail coffee market to grow 6 percent in 2008, a substantial jump from Mintel’s original forecast of 2.4 percent, while gourmet purchases from retailers has fallen. Additionally, Tully’s has been too focused on expansion rather than investing in stores to ensure they are profitable, this has caused profitability problems and creates a problem generating positive net income for Tully’s.

PATTERNS OF SENTENCE STRESS IN THE ENGLISH OF JAPANESE SPEAKERS
Tulluck, Marco
Faculty Mentor(s): Xingzhong Li, English

18 (Oral Session 12:00-1:40 in 140)

Recent studies have suggested that sentence stress, prominence, and the stress-timed rhythm of English are problematic for Japanese learners of English. The non-native pronunciation of these suprasegmental features negatively affects intelligibility and perceptions of the speaker’s intent and meaning. This study investigated the correlation between patterns of sentence stress in Japanese learners’ English and their proficiency levels in order to gain a better understanding of the internal processes and external factors influencing the acquisition of these features. The participants included six university exchange students from Japan at intermediate, upper-intermediate, and advanced levels, as well as a control group of two native English speakers. Participants were recorded while working in pairs to complete a “spot the difference” activity. The audio was then transcribed and each syllable marked for its level of stress on a scale of one to four. The data indicated that the upper-intermediate and advanced learners used much more native-like patterns of sentence stress than the intermediate group. The upper-intermediate and advanced groups indicated prominence 2.7 times more frequently through higher levels of stress and exhibited a wider range of stress levels, converging closer on the native model. However, the intermediate group still displayed a clear understanding of the discoursal function of stress to mark important information, new information, emphasis, and contrast. The results of this study indicated that language transfer and affective variables present the most compelling account for Japanese learners’ late acquisition of native-like patterns of English sentence stress.
IMPROVING COSTS WITHOUT SACRIFICING THE QUALITY
Valentine, Alienor; Boivin, Alan; Marx, Chelsea
Faculty Mentor(s): Kun Liao, Finance & OSC

As an airplane manufacturer, Boeing Company is upheld to high standards, most of which are federally mandated. Before an airplane is deemed fit to be ready to fly, it must pass rigorous tests. An airplane system encompasses many subsystems (such as lighting, air flow) which are tested individually. The process of testing and getting approvals is time and labor intensive. Indeed, a pair of technicians tests a subsystem. For purpose of this example, let’s assume that they are testing the lighting system. If the test shows expected results, then the technicians move on to another subsystem. If the test fails, they need to request documentation and permission from a Quality Assurance inspector to do all that is required to fix the problem. After the permission is granted, the technicians may fix the discrepancy. The inspector’s presence is then requested so that the quality of the repair or rework can be verified and documentation finalized. If the rework is okayed, and the test passes, the technicians may move on to another subsystem test. As Boeing’s competition with its direct rival -Airbus- is more intensive than ever before; it seeks to reduce its costs-per-job by 10% below last year’s level. Our project will look on how to improve the quality processes by looking at the various causes for the reworks. The flow process will be used as the primary tool along with cost data.

TESTING THE EFFECTS OF ATRAZINE ON BEEF HEART MITOCHONDRIAL FUNCTION
Valera, Amanda
Faculty Mentor(s): Carin Thomas, Chemistry

40 (Morning Poster Session in Ballroom)

The purpose of this research was to investigate the effects of atrazine on mitochondrial function in isolated beef heart mitochondria. Atrazine (ATZ) is a commonly used herbicide in agriculture throughout the United States and has been detected in surface, ground, and drinking water which exposes many organisms to this chemical. Mitochondria are intracellular organelles that produce much of the cell’s chemical energy currency in the form of adenosine triphosphate (ATP). Mitochondrial bioenergetics can be used to further understand harmful effects of the herbicide atrazine at the subcellular level. In this research, isolated beef heart mitochondria were exposed to atrazine and mitochondrial electron transport chain (ETC) activity was measured by monitoring oxygen consumption. Experiments were designed to measure the concentration and time dependence of atrazine-induced effects on mitochondrial function. Time course effects were measured after 0, 5, 10 and 20 minute incubation periods of atrazine exposure, and concentration effects were studied at 0.01mM, 0.1mM, 0.5mM, and 1.0 mM of atrazine dissolved in the solvent dimethylsulfoxide (DMSO). All treatments were compared to controls conducted without atrazine but in the presence of the solvent DMSO. In this research, no significant difference in oxygen consumption was observed in the atrazine groups as compared to the controls, indicating that atrazine does not inhibit mitochondrial electron transport.

TEACHING ARCHAEOLOGY WITH GIS: A STUDENT’S PERSPECTIVE
Vargas, Estanislado
Faculty Mentor(s): Steven Hackenberger, Anthropology and Museum Studies

40 (Morning Poster Session in Ballroom)

Archaeological applications of Geographic Information Systems (GIS) have significantly increased in recent years for research and teaching. This poster illustrates how ArcGIS can be used as a digital learning tool to teach the spatial concepts involved in archaeological site inventory and excavation. I participated in learning sessions conducted by Marc Fairbanks along with other students in Dr. Steven Hackenberger’s introductory archaeology class (ANTH120). I assisted in the testing of ArcGIS applications for: (1) analysis of local-scale site distributions within Hells Canyon, Idaho, and (2) analysis of site-scale artifact distribution for the Tryon Creek house excavations in Hells Canyon. Critical and spatial thinking was encouraged by examining the local distribution of different types of sites and the distribution of different types of artifacts within the Tryon house site. Students formulated hypotheses about local site locations based on their spatial relationships to one another and proximity to usable resources. Students were asked to infer site function based on the spatial relationships of differing artifact types within each cultural layer of a house excavation. An interactive 3-Dimensional model of the excavated Tryon Creek house feature was also used to explore artifact and feature distributions for each layer of house occupation.
FORECASTIT: ANALYSIS ACCELERATED--MOBILE ANALYSIS APPLICATIONS AND ON-DEMAND CONSULTING

Voronov, Eliyahu; Throndsen, Logan
Faculty Mentor(s): Thomas Tenerelli, Economics; Cen-Tsong Lin, Mathematics; Carlo Smith, Finance & OSC

41 (Afternoon Poster Session in Ballroom)

Business Summary: ForecastIT provides software-aided research and analysis for small to medium sized organizations and investors. The Company offers data mining, model building, forecasting, crowdsourcing and report generation solutions. ForecastIT offers an easy to use SaaS-based, mobile/web research and analysis platform. Problem/Solution: In today’s rapidly changing, global marketplace, understanding real time data is important for decision making and strategic planning. Most organizations are forced to use complex software that is time consuming and requires expensive trained analysts. An efficient, easy to use, cost effective solution is needed. Market Need and Opportunity: All types of organizations and investors can benefit from making more informed decisions based on real time data analysis. However, most small to medium sized organizations and investors cannot afford the kind of research and analysis conducted by Fortune 500 companies and institutional investors. ForecastIT is the solution that small to medium sized organizations and investors need. Competitive Advantage: ForecastIT can be used by both math and non-math oriented people. It integrates with Excel, providing the ability to generate pre-built models. This enables even expert forecasters a faster method to build models for further analysis in Excel. ForecastIT automatically records models discovered by academic customers that meet the model selection criteria. This generates an ever expanding repository of models based on real time data. This information is shared with customers and is used to gain valuable insight into real time data analysis and the model discovery process.

SYNTHESIS OF CLAVATADINE A

Vreeland, Shannon
Faculty Mentor(s): Steve Chamberland, Chemistry

40 (Morning Poster Session in Ballroom)

Clavatadine A is a natural product that has not been synthetically synthesized and has been found to have unique blood-thinning characteristics. It inhibits blood clotting factor Xla by irreversible covalent bonding of the carbamate functional group to the active serine residue in the blood-clotting factor. The purpose of this project is to synthesize Clavatadine A so that further study can be done regarding its possible medical significance. Once created, research can also be done to possibly change the covalent bonding of the carbamate group to make the molecule have reversible activity, and make it safer for use in the human body. The synthesis of two starting pieces that will be joined by the active carbamate group, an azide and an aromatic piece, have been worked on. A precursor to the starting azide has been synthesized in a 90% yield, while the aromatic starting material has been worked on without convincing characterization or yield.
We assessed the amount and type of shoreline habitat that would be inundated through proposed 0.3-0.6 m increases in full pool water levels on Banks Lake, Washington, including an assessment of the vulnerability of various shoreline types to increased erosion along the 201 km of shoreline. Using airphotos and field checks, the shoreline was classified and digitized into 11 habitat types based on morphostatigraphic geomorphic units and presence of armoring. Using GIS, the potential inundation of shoreline habitat was quantified using a bathymetric model interpolated from digitized topographic and bathymetry information. Erosion susceptibility of the Banks Lake shoreline was determined by creating an expert weighted model that combined shoreline type, nearshore slope characteristics, and output from a weighted wind fetch model that incorporated fetch for multiple wind directions. Estimates of inundation and erosion susceptibility were quantified by habitat type, and mapped on a GIS map. The inundation zones and shorelines most vulnerable to erosion were characterized based on state-wide GIS datasets related to wetland and priority habitats, including the National Wetland Inventory and priority habitat information obtained through Washington Department of Fish and Wildlife. Inundation through 0.3-0.6 m increases in full pool levels could flood between 1.3-2.2 million m$^2$ of shoreline habitat, while 8.1% of the shoreline has high erosion susceptibility. Inundation and erosion susceptibility varies considerably according to shoreline type, both in terms of spatial extent as well as the type of habitat and species that are impacted, including eight wetland classes and fourteen priority habitats.

WOMEN'S SUFFRAGE – A READERS' THEATRE
Walker, Sharryn; Byman, Katelyn; Bradford, Keeley; Wood, Jessica; Mannin, Jennifer; Hiatt, Cynthia
Department: Education

The Preservice Teachers enrolled in EDLT 419 Storytelling Techniques at Central Washington University created Readers’ Theatre podcasts celebrating the 100th Anniversary of the Women’s Right to Vote in the State of Washington. Each pair of teacher candidates researched an aspect of the Women’s Suffrage Movement and shared their findings in class. Topics ranged from the Seneca Falls Convention, the role the sale of cookbooks played in financing the movement, and the views of men and women pertaining to the right to vote. Specific biographies of women in the movement including Alice Paul and Ina Phillips Williams were also researched. Using the information gathered, each pair of candidates wrote a draft of a script. The drafts were shared in class with another pair. These initial drafts were revised several times before being recorded. Using GarageBand, each pair made a voice recording of their script, followed by inserting background music and sound effects. The performances presented today are a few of the Readers’ Theatre available in podcast form at itunes. cwu.edu
A DESCRIPTIVE ANALYSIS OF CHIMPANZEE’S SIGNED CONVERSATIONS

Wallin, Jason
Faculty Mentor(s): Mary Lee Jensvold, Chimpanzee and Human Communication Institute; Roger Fouts, Chimpanzee and Human Communication Institute; Deborah Fouts, Chimpanzee and Human Communication Institute

40 (Morning Poster Session in Ballroom)

The cross-fostered chimpanzees Washoe, Moja, Tatu, and Dar acquired signs of American Sign Language (ASL) in much the same way as human children do—in natural, conversational settings where their human companions always considered them to be communicative partners. The chimpanzee Loulis acquired signs of American Sign Language from Washoe and other signing chimpanzees in equally natural, conversational settings. Today, at the Chimpanzee and Human Communication Institute (CHCI), the chimpanzees continue to converse freely in signs of ASL with one another and with their human caregivers. As part of ongoing data collection, researchers at CHCI often videotape and transcribe these chimpanzee-to-human conversations. In the current project, we analyze portions of this corpus of transcriptions to better describe the chimpanzees’ signing. We determine rates of initiation, incorporation, and other characteristics of the chimpanzees’ conversations. We also identify collocations, signs that regularly occur together in the chimpanzees’ utterances. Finally, we compare the distribution of the chimpanzees’ signs in the corpus to that predicted by a power-law function (Zipf’s law).

KITTITAS COUNTY POLITICS: THE TRIUMPH OF CONSERVATISM

Ward, Randall
Faculty Mentor(s): Karen Blair, History; Thomas Wellock, History

8 (Oral Session 9:30-10:50 in 137A)

The Cascade Range divides the state of Washington not just geographically but politically. Driving across the pass from Seattle to eastern Washington offers a glimpse of two distinct worlds. To the west: Seattle, Tacoma, Olympia, Everett, Bellingham—liberal, green, urban; to the east: the Tri-cities, Yakima, Spokane, Wenatchee—traditional, sparse, rural. Although Spokane is in fact the second largest city in Washington, it has much more in common with Boise than its urbane state-mate Seattle to the west. Kittitas County, straddling the border between mountain and desert, offers an interesting glimpse at Washington’s political-geographic divide. Specifically, this paper addresses the politically volatile period following the onset of the Great Depression and follows the resultant political shifts until our present time. The primary goal of this project was to answer the following question: How and why did Kittitas county slowly transition from giving over seventy percent of their votes to the Democratic Party to giving almost as many to the Republicans less than two decades later? Two important factors emerged which help to answer this question—neither of which involve a major shift in the political outlook of the county. The first is demography, and the county underwent major demographic shifts during and after the depression. The second is the severity of the depression itself. This paper covers both trends in detail, discussing the rise and fall of the Democratic Party and the principle causes of that political shift.
SOIL AND GROUNDWATER NUTRIENTS ARE IMPORTANT TO COTTONWOOD GROWTH RATES IN RIVER FLOODPLAINS

Westmark, Danielle
Faculty Mentor(s): Tom Cottrell, Biological Sciences; Clay Arango, Biological Sciences

40 (Morning Poster Session in Ballroom)

Cottonwood trees are important to riparian zones; they provide habitat structure for fish, deer, and other animals. Their dense root masses prevent river banks from eroding, and their canopies provide important habitat for animals by providing shelter from predators and areas to raise young. Cottonwoods depend on uptake of ground water and the dissolved nutrients in groundwater for their survival and reproduction. In this project we studied a vegetated bar within the Yakima River floodplain at Ringer Loop south of Ellensburg near the mouth of the Yakima Canyon. Groundwater downwells into the vegetated bar as hyporheic (i.e., underground) flow and upwells after passing through it. Nutrient dynamics are strongly influenced by the flow of the river as it moves underground. Concentrations in the ground water nutrients increase or decrease depending location on the bar. We hypothesized that cottonwood growth would be related to the groundwater chemistry. We selected three test sites in the riparian forest; one in the downwelling zone, one in the upwelling zone and one in between the two. We collected 6 soil samples from each site and determined the mass of fine cottonwood roots (less than 2 mm diameter) and correlated these to rates of annual growth (by annual rings), as well as finding their soil textures. We tested the soil and ground water samples for ammonium, nitrate and phosphorus and will relate these to growth rates. This study is important to understanding soil nutrients and cottonwood growth in riparian regions that are frequently disturbed.

MANASTASH SHOWCASE

Whitcomb, Katharine; Dykes, Ashley; Cavazos, Pedro; Milne, Stefan; Grogan, Ben
Department: English

12 (Oral Session 9:30-10:50 in 202)

The English Department would like to showcase our student-edited, student produced annual literary and arts magazine, Manastash. The presentation will feature a series of short readings by student writers whose literary work is featured in the forthcoming 2010 issue of Manastash, and by students on the editorial/production staff. The faculty editorial supervisor, Katharine Whitcomb, will introduce the reading with a few words about the role of Manastash at CWU.

HOW NOT TO LOVE: CHAUCER’S GUIDE FOR LOVERS

Wildes, Sheena; Higgs, Kathryn
Faculty Mentor(s): Laila Abdalla, English

27 (Oral Session 1:50-3:30 in 140)

Writers of the Middle Ages drew a sharp distinction between “courtly love,” which idealized and romanticized the beloved, and “sensual love,” which focused on sexual gratification. Although courtly love and sensual love are opposite in many ways, they share one major similarity: the selfish objectification of the beloved. The medieval English poet Geoffrey Chaucer wrote about the selfishness of both courtly love and sensual love in his works The Parliament of Fowls and The Canterbury Tales -- particularly The Knight’s Tale, The Miller’s Tale, and The Wife of Bath’s Prologue and Tale. Close examination and comparison of these works shows that Chaucer warns his readers against selfishly objectifying one’s beloved. Chaucer subtly teaches that true love must eschew selfishness and instead focus on the wishes and well-being of the beloved.
NO ‘LIKE CONSORT’ NO TRUE PARADISE: HOW MILTON’S MISOGYNY UNDERMINES HIS THEODICY

Wildes, Sheena
Faculty Mentor(s): Karen Turcotte, Douglas Honors College

34 (Oral Session 3:40-5:40 in 137B)

John Milton declared a twofold purpose in writing Paradise Lost: to create a great literary epic and to “justify the ways of God to man.” Although Milton succeeded in his literary ambitions, he had less success in proving the righteousness of God. Milton fails to provide a convincing theodicy because of his own low view of women, evident in his characterization of Eve. The pre-lapsarian relationship between Adam and Eve is already imperfect and ripe for catastrophe because Eve is mentally inferior to Adam, because her submission to Adam is pseudo-reluctant, and because her suggestions are unfailingly wrong. By making Eve an unfit companion for Adam, the God depicted by Milton has failed to create a true Paradise, and has prepared the way for the Fall of humanity.


Wildes, Sheena
Faculty Mentor(s): Roxanne Easley, History

17 (Oral Session 12:00-1:40 in 137B)

Between 1855 and 1864, the Russian folklorist Alexander Afanas'ev set out to collect the traditional folktales of his country. Many of the tales center around the journey and exploits of a young man, but one tale featuring a prominent female protagonist is that of Baba Yaga and Vasilisa the Beautiful. This tale is of particular interest to a student of women’s history because it contains almost no male figures; rather, it focuses on a tension between types of “good” femininity and “bad” femininity. On close examination, the tale can be seen to root the distinction between “good” and “bad” women in “good” and “bad” motherhood, attributing tremendous power to a mother, particularly to a “good” mother. Furthermore, historical analysis reveals that the tale reflects Russian beliefs in the power of motherhood which have roots in both noble and peasant values stretching far back into the pre-imperial period of Russian history.

THE EFFECT OF A HIGH-FAT DIET ON THE NEUROMUSCULAR PHYSIOLOGY USING THE ROUNDWORM, C. ELEGANS

Willauer, Patrick
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

40 (Morning Poster Session in Ballroom)

C. elegans is a small roundworm, used as a model organism to study genes affecting metabolism. It has been shown feeding worms a high-fat saturated diet will produce high levels of reactive oxygen species (ROS) in C. elegans (Bryner, Thomas and Carnell, SOURCE 2009), which are harmful to cells and organisms. The C. elegans mutant, nnt-1, lacks the enzyme nicotinamide nucleotide transhydrogenase (NNT), which catalyzes the transfer of protons from NAD(H) and NADP(+). NNT’s normal function is to protect cells against cellular damage caused by ROS. We were interested in examining what affects high-fat diets, would have on wild-type (N2) and nnt-1 mutant worms. The wild-type and nnt-1 mutant worms were grown up under three different conditions: control agar plates containing normal food (OP-50 bacteria) and treated plates that in addition contained high concentrations of stearic acid (saturated fat) or oleic acid (unsaturated fat). After three days on the plates the worms were transferred to six-well plates and their rates of locomotion were measured and analyzed by video and the computer software, Wormtracker. Initial analysis of the data shows the wild-type worms fed a high-fat diet have normal rates of locomotion compared to control treatment, while the nnt-1 mutant worms appear to show slower speeds when grown on plates containing oleic or stearic acid (179 μm/s and 147 μm/s versus control (241 μm/s)). The nnt-1 mutants grown on fatty-acid diets appear to show decreased neuromuscular activity, which is possibly due to an increase in the production of free radicals.
LADIES, GENTLEMAN, AND LIBEL: IMPERIAL DIMENSIONS OF CIVILITY AND GENDER IN THE VICTORIAN PRESS
Willden, Andrew
Faculty Mentor(s): Jason Knirck, History

17 (Oral Session 12:00-1:40 in 137B)

Throughout the nineteenth century, India was the center of the British empire. In 1885, Dadaji Thakur filed suit against his wife, Rukhmabai. He claimed that although he had married her eleven years earlier, when she was a child, she was now legally bound to live with him and consummate the marriage. Rukhmabai and her supporters took their case to the public. What ensued were two years of heated debate in the press throughout the British Empire, ultimately resulting in Dadaji’s uncle, Daorji, filing a libel suit against the Times of India, the Bombay Gazette, and Rukhmabai. The event was publicized around the British empire, appearing in papers from England, Scotland, India, and Australia. What is striking about the case is not only how far it reached, but also how each newspaper framed the parties of the case almost entirely in terms of their gender and civility. Virtually all British and reformist leaning papers framed Rukhmabai as a learned lady, while her husband was a mere sexual deviant, or worse, an ignorant “coolie”. In contrast, more conservative Indian newspapers tended to view Rukhmabai as an unfeeling, unwomanly asexual and Dadaji as a devout, caring husband. These conceptions of gendered civility were often at the heart of the imperial relationship between Britain and its colonies. This case illustrates the role of the press as an agent in actively creating those same conceptions of civility and gender, and as a source of a nascent, shared imperial culture.

RETENTION OF FIRST-YEAR STUDENTS OF COLOR IN HIGHER EDUCATION
Williams, Emily
Faculty Mentor(s): Nelson Pichardo, Sociology; Jesse Nelson, Communication; Michael Harrod, Sociology

41 (Afternoon Poster Session in Ballroom)

The retention of first-year students of color in higher education has always been a serious social issue in America. Statistics show that the majority of American colleges and universities have not successfully retained students of color. Several researchers have argued that this is a function of either structural or personal factors. Among the structural factors noted are financial hardship, student-faculty relationships, campus climate, and social integration on campus. Among the personal factors are included a student of color’s self-concept, academic preparation, satisfaction with peers, study habits, and career aspirations. The goal of this research project is to better understand why so many institutions of higher learning are failing to retain students of color. This research project will fill a void on the subject by examining whether campus-wide programs dealing with the issue of race have any impact on retention rates. I will use the information I have found through working with the Central Washington University Retention Task Force, the literature I have encountered, and the student success survey I have developed in order to impact the retention of students of color at my school. I plan to inform students through pamphlets of retention rates at CWU, and also give students and faculty tips or ways they can increase student retention.
MONITORING AWAKENING VOLCANOES USING LAPTOP COMPUTERS

Wilson, Richard
Faculty Mentor(s): Lisa Ely, Geological Sciences

41 (Afternoon Poster Session in Ballroom)

This study investigated whether the internal accelerometer in a MacBook Pro® is sufficiently sensitive to be used as a seismometer capable of detecting volcano-generated seismicity. If so, laptop computers may provide a relatively cheap, rapidly deployable platform for collecting preliminary information for use by scientists and governmental agencies in charge of evacuating threatened local populations. Nevado de Colima Volcano, Mexico was chosen as a “test-site” for this experiment because it is one of the most active volcanoes in North America and produces frequent (~1 event/4 hours) seismic signals in the magnitude range of awakening volcanoes elsewhere (< M2). A laptop computer was positioned near the southwestern base of the edifice, approximately 5 km from the active crater, for a five hour period on 25 March 2010. Four episodes of heightened volcanic activity including: explosion-generated rockfalls, pyroclastic flows and lava extrusions were visually observed and documented for later correlation with seismic signals recorded by the laptop seismometer. The internal accelerometer did not detect any of the observed volcanic events. Because volcano volcanic seismicity at Colima Volcano is generated within the edifice, mainly near the summit, seismic waves are probably not well transmitted to locations away from the base of the volcano. This interpretation is borne out by seismograms recorded by the UNAM Colima seismic network. Another experiment is planned, this time at an truly awakening volcano, where seismic activity will be focused at greater depth and of sufficient intensity to be detected by the laptop recording system.

ADDING A SPATIAL PERSPECTIVE TO COLLABORATIVE CONFLICT MANAGEMENT: A CASE STUDY FOR ELK MANAGEMENT PRACTICES IN THE UPPER SNOQUALMIE VALLEY, WASHINGTON

Winter, Kristen
Faculty Mentor(s): James Huckabay, Geography

41 (Afternoon Poster Session in Ballroom)

Increasing large ungulate populations and expanding urban areas raise concerns about public safety, property damage, and wildlife health. In the upper Snoqualmie Valley of King County, Washington, a local collaborative committee, the Upper Snoqualmie Valley Elk Management Group (USVEMG), has formed to seek solutions to the impacts of the resident elk herd in the valley. To date, the committee has not been able to reach agreement on a plan for management. The purpose of this study is to assess current management practices of the USVEMG and develop a collaborative conflict management model. The study will use data gathered from interviews with the stakeholders and existing literature to explore different practices of wildlife management and methods for facilitating collaboration among disparate stakeholders. Additionally, this study investigates of the utilization and implementation of geospatial tools within the process of collaborative conflict management. The results will provide a framework to assist with development and implementation of a plan to manage elk, and will segue into a larger investigation of models for big game management practices in the West.
MASS WASTING INVENTORY OF THE YAKIMA RIVER CANYON
Winter, Tom
Faculty Mentor(s): Karl Lillquist, Resource Management

41 (Afternoon Poster Session in Ballroom)

Landscape evolution in the Yakima Fold Belt of Central Washington is thought to be heavily dependent on mass wasting events such as landslides, debris flows, and rockfall. This analysis identified, classified, and mapped past mass wasting events, as well as areas prone to future mass wasting in Central Washington’s Yakima River Canyon. From this work, I identified the spatial causes and distribution of these events. Using airphoto interpretation, LiDAR, historical records, and field observation, I identified 35 landslides, 28 debris flows, and 112 rockfall areas. These were classified by morphology as inactive-old, inactive-mature, inactive-young, and active. Inactive-old was the most common morphology for landslides. Debris flows and rockfall have higher frequencies of inactive-young and active morphologies. Mass wasting features encompass ~16% of the study area, with deep seated landslides at ~7%, rockfall ~9% and debris flows <1%. I used historical records to identify an additional 15 smaller mass wasting events that could not be mapped or classified due to uncertainties in descriptions. Hazardous areas were identified based on geology, distance to streams, land use, and slope. The Yakima River Canyon is a major transportation corridor for recreationalists and residents, and is experiencing increased development. The creation of a mass wasting inventory and hazard map will help mitigate potential damages to infrastructure and transportation.

VALUE OF ATHLETICS AT CENTRAL WASHINGTON UNIVERSITY
Winter, Tim; Ravnik, Andrea; Serhiyevich, Alena; Chandley, Josh; Ehling, Justin
Faculty Mentor(s): Jeff Stinson, Management

13 (Oral Session 9:30-10:50 in 301)

Throughout the history of intercollegiate sports university stakeholders have debated over the true value of collegiate athletic programs. Recent budget constraints in higher education have increased the scrutiny of such programs. Our research stems from the desire for a more complete understanding of the value of athletics to Central Washington University (CWU). Our assessment of this value is derived indirectly through the measurement of current CWU student attitudes and behaviors. Four separate independent research studies were completed. The independent research questions asked were; 1. Amongst classes, what proportion of students attends athletic events, and what are their motivations for attendance? 2. What are student’s attitudes toward athletics in general and CWU athletics specifically? 3. Do students at CWU value the University more because of athletic programs? 4. What is the relative value of CWU athletics to enrollment and retention? In order to answer these research questions, each research team gathered independent data via intercept surveys one CWU’s Ellensburg campus. In aggregate, respondents exceeded 500. Analysis of the results was done using SPSS statistical software. Consequential findings from the independent studies exhibited a strong degree of convergence. Combined results strongly suggest that a significant segment of CWU students place significant value on athletic events and programs and that the removal of athletic programs would negatively affect university enrollment and student retention. In light of this, we conclude that athletic programs add to the overall value of Central Washington University.
Work is being conducted to fit a model to the surface adsorption thermodynamics of aqueous poly(sodium 4-styrene sulfonate) (PSS) on TiO$_2$. Using total internal reflection Fourier transform infrared spectroscopy, concentrations of PSS at the TiO$_2$ surface have been found and related to concentration of PSS in bulk solution. The research next consists of two parts: First, to find the mass of PSS that is adsorbed in layers on the surface from this experimental data. Second, to find a relationship between the mass adsorbed and the surface adsorption energy (defined as $\frac{U_A - U_B}{kT}$ where $U_A$ and $U_B$ are the adsorption energies of the solvent and polymer respectively, $k$ is the Boltzmann distribution constant, and $T$ is the temperature in Kelvin). Mass adsorbed is plotted as a function of surface adsorption energy with various Flory-Huggins values which will provide insight into the bonding characteristics of PSS on the TiO$_2$ surface.

The chimpanzees who currently live at the Chimpanzee and Human Communication Institute in Ellensburg, Tatu, Loulis, and Dar, use the signs of American Sign Language to communicate with their human caregivers and each other. Tatu and Dar were cross-fostered, raised as human children, and learned their signs from both human caregivers and members of their chimpanzee families. Loulis was the first nonhuman to acquire a human language from another chimpanzee; his adoptive mother, Washoe. The current study examined the signing patterns of Tatu, Loulis, and Dar with their human caregivers and each other over the past ten years (2000 to 2009). Researchers analyzed data from behavioral logs that contained contextual and detailed information about interesting interactions either between chimpanzees or between the chimpanzees and their human caregivers. Interesting patterns emerged in their selection of conversational partners and the context in which they most frequently. Early analysis suggests that the chimpanzees often sign in the affinitive social behavioral context, initiating interactions rather than simply repeating signs made by their conversational partners. Tatu, Loulis, and Dar acquired their signs in a conversational context, and this study illustrates that they continue to use their signs in conversational ways.
After the U.S. military intervention, American officials and developers hoped to use their “soft power” of political, economic, and social aid to make Grenada a model for modernization for the islanders and other Third World populations. Grenadians welcomed the intervention and saw the return of democratic politics and a capitalist economy. The U.S. improved many sectors of society but in doing so sometimes created new, unintended consequences. Government, humanitarian, and corporate interests clashed, producing mixed results. The island enjoyed significant upgrades in infrastructure and services, but also economic strain and unsustainable development on the island. In the short-term, under U.S. guidance, policy goals were, for the most part, achieved. However, once U.S. assistance was removed, Grenada could not sustain some of the modernized projects. The island thus depended on outside aid to achieve development goals. In essence, post-invasion Grenada points to the uneasy combination of Third World conditions and U.S. efforts at nation-building in local experiences during the Cold War. The study discusses Grenada’s educational development and explains the reversal of the island’s socialist-oriented education programs and those replaced with American-style ones. It shows that Grenadian government and U.S. education goals and efforts sometimes clashed. It explains why many Grenadians bought into U.S. programs and how these efforts improved school conditions, learning environments, and teacher training. This study addresses development projects by USAID, the Peace Corps, and various private sector entities. It also stresses the island’s reliance on foreign aid for objectives in education.

A new integrated theory of water management is emerging among water managers from the global to the local level. The “Integrated Water Resources Management” model is designed as a portfolio to cope with the dual problem of water scarcity and population growth. Elements to be integrated into a portfolio include sustainability logics, logistics and initiatives. Before the approach became popular among water managers, policymakers in Las Vegas were developing an approach that might be viewed as this model’s prototype. The Las Vegas portfolio combines rhetoric, content, formulation and implementation, all of which are reframed on a continuing basis in response to feedback from impacts. When it comes to “logics” the Las Vegas case clearly shows that “logics” are nothing more than competing, often contradictory, rhetorics that are extended, discontinued and substituted depending on the perceptions of target audiences. In effect, those policies crafted to sell the sustainability of desired futures or the status quo (continuance of present trends) which work become sustainable even when they undermine the viability of the area and exacerbate water scarcity. Research findings include: (a) Rhetoric is used to mask agendas. (b) Policy is crafted to avoid problems. (c) Initiatives and associations actually manufacture consent. (d) Litigation is used to control challenges to the “sustainability” of policies.
2009 STUDENT PRESENTATION AWARDS

Each year, a selection of student presentations is recognized with Outstanding Student Presentation Awards. The awards are based on a review of presentations by a panel of volunteer faculty and staff judges.

OUTSTANDING ORAL PRESENTATIONS

ANALYZING CONDITIONAL PROBABILITIES THAT ARE COMMONLY COUNTER-INTUITIVE: WHY YOUR DOCTOR MAY BE WRONG AND HOW TO WIN ON GAME SHOWS
   St. Brown, Max; Mentor: Bob Carbaugh, Economics

THE MISCONCEPTIONS OF THE WESTERN WORLD ON ISLAMIC WOMEN
   Harlan, Justine; Mentor: Laila Abdalla, Douglas Honors College

SOCIO-ECONOMIC IMPACTS OF HYDRO POWER DAMS: THE BUI DAM PROJECT, GHANA (WEST AFRICA)
   Otu-Tei, Clement; Mentors: Kathleen Barlow, Anthropology and Museum Studies; Morris Uebelacker, Geography

TERRESTRIAL AND MARINE FOOD SUBSIDY TO SALMONID DIET: A STABLE ISOTOPE STUDY ON THE YAKIMA RIVER
   Johnson, Allison; Mentor: Paul James, Biological Sciences

MANASTASH SHOWCASE
   Cavazos, Xavier; Mentors: Katharine Whitcomb, English; Joseph Powell, English; Lisa Norris, English

CHAUCER AND THE TRUE VALUE OF ORDINARY EXPERIENCE
   Wildes, Sheena; Mentor: Laila Abdalla, Douglas Honors College

INTEGRATING CWU CHESS IN THE ARENA CHESS GUI
   Littlefield, Kyle; Mentor: Razvan Andonie, Computer Science

RACE AND PERCEPTIONS OF INJUSTICE: EVIDENCE FROM ATTITUDES ON THE DEATH PENALTY SURVEY
   Johnson, Michele; Mentors: Eric Cheney, Sociology; Sarah Britto, Law & Justice

ADULT BEGINNERS PIANO WORKSHOP: RESEARCH AND IMPLEMENTATION OF SKILL-BUILDING TECHNIQUES AND MATERIALS FOR LIFE-LONG LEARNING AND ENJOYMENT
   Jaffe, Jan; Mentor: Bret Smith, Music

PUNNING THE PUDENDUM: VIOLENCE, LOVE, AND LEARNING IN CHAUCER’S MILLER’S & WIFE OF BATH’S TALES
   Sander, Dustin; Mentor: Laila Abdalla, English

FROGS IN SPRING ALL WINTER: OVERWINTERING OF CASCADES FROGS IN WASHINGTON STATE
   Barreca, April; Irwin, Jason; Mentor: Jason Irwin, Biological Sciences

QUANTITATIVELY MODELING SURFACE TRAPPING IN NANO-SCALE YTTRIUM OXIDE DOPED WITH EUROPNIUM
   Mann, Rusty; Mentor: Anthony Diaz, Chemistry

MARY, LILITH OR EVE: WOMEN’S ROLES WITHIN NAZI GERMANY
   Geise, Sasha; Mentor: Heidi Szpek, Religious Studies

QUESTIONING SUSTAINABILITY RHETORIC: WHEN CULTURAL PRACTICES SUSTAIN DEPLETION OF NATURAL RESOURCES (AN EXAMINATION OF LAS VEGAS CITY OFFICIALS’ SUSTAIN LAS VEGAS POLICY #CM-302)
   Zimmerman, Kathryn; Mentors: Rex Wirth, Political Science; Morris Uebelacker, Resource Management; Kathleen Barlow, Resource Management; Nancy Hultquist, Resource Management

NO CAUSE FOR ALARM: A NARRATIVE VIDEO ESSAY
   Iiyama, Brian; Allum, Kyle; Brown, Nick; Mentor: Michael Ogden, Communication
USE OF MELTS MODELING AND DETAILED TEXTURAL AND CHEMICAL CRYSTAL POPULATION STUDIES TO DOCUMENT MAGMA CHAMBER PROCESSES AT MT. ETNA, SICILY
Moses, Maureen; Bohrson, Wendy; Mentors: Wendy Bohrson, Geological Sciences; Christopher Mattinson, Geological Sciences

EFFECT OF SEROTONIN ON LOCOMOTORY BEHAVIOR IN THE ROUNDWORM, C. ELEGANS
Foss, Eric; Mentor: Lucinda Carnell, Biological Sciences

FUZZY ARTMAP RULE EXTRACTION IN COMPUTATIONAL CHEMISTRY
Abdul-Wahid, Badi'; Crivat, Bogdan; Abdul-Wahid, Sarah; Mentors: Razvan Andonie, Computer Science; Levente Fabry-Asztalos, Chemistry

CLEAR AND DIRECTIVE: VALUE CLARIFICATION AS A TOOL FOR ADVANCE DIRECTIVES
Blesi, Lauren; Mentor: Matthew Altman, Philosophy

INCORPORATING FILM INTO THE WOMEN’S STUDIES CLASSROOM
Johnson, Melissa; Department of English

INTEGRATED MARKETING COMMUNICATIONS PLAN FOR HABITAT FOR HUMANITY
Sundborg, Susanna; Reinhardt, Ian; Wohlfarth, Stephanie; Peck, Michael; Mentor: Jeffrey Stinson, Management

FREQUENCIES AND WAVELENGTHS FROM A NEW FAR-INFRARED LASING GAS: 13CHD2OH
Petersen, Travis; Mentor: Michael Jackson, Physics

OUTSTANDING POSTER PRESENTATIONS

CWU-DES MOINES

THE SLIPPERY SLOPE: A CONNECTION BETWEEN SMOKING AND DRUG ATTITUDES
Scalf, Natalie; Engel, Cynthia; Mentor: Edward Kingston, Psychology

CWU-LYNNWOOD

CRIME RATES AND THE STATE OF THE ECONOMY
Layher, Reed; Mentor: Krystal Noga-Styron, Law & Justice

CWU-ELLENSBURG

ELEMENT CONCENTRATIONS IN DRINKING WATER FROM A.C. DAVIS HIGH SCHOOL, YAKIMA, WA
Orem, Caitlin; Kendrick, Casey; Mentors: Beth Pratt-Sitaula, Geological Sciences; Carey Gazis, Geological Sciences

USE OF VISIBLE SPECTROSCOPY TO MONITOR THE REMOVAL OF BROMOTHYMOL BLUE FROM WATER USING A POLYELECTROLYTE/SURFACTANT/TIO2 SYSTEM
Best, Brittany; Tasker, Adam; Hodges, Dave; Mentors: Dion Rivera, Chemistry

SEXUAL DIMORPHISM OF RECOMBINATION RATES AS A CONSEQUENCE OF SEXUAL CONFLICT
Buxel-Florenzen, Stefanie; Mentor: Lixing Sun, Biological Sciences

THE EFFECTS OF TEMPERATURE ON METABOLIC RATE, VENOM SYNTHESIS, AND POTENCY IN PEUCETIA VIRIDANS (ARANAEAE: OXYOPIDAE)
Galindo, Joanna; Irwin, Jason; Carnell, Lucinda; Galindo, Gracie; Mentors: Jason Irwin, Biological Sciences; Lucinda Carnell, Biological Sciences

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   Judy, Krystal; Smith, Talitha; Mentor: Tracy Andrews, Anthropology and Museum Studies

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   VanTine, Launi; Mentor: Steven Hackenberger, Anthropology and Museum Studies

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   Paulk, Amber; Zayac, Ryan; Department of Family & Consumer Sciences

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   Shea, Holly; Fredrickson, Carl; Oosahwee-Voss, Eric; Mentor: Morris Uebelacker, Geography

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   Shapley, Helen; Mentor: Morris Uebelacker, Geography

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   Nauer, Christian; Mentor: Steven Hackenberger, Resource Management

ELEGANCE TO ITS LIMIT
   Martini, Jenni; Mentor: Andrea Eklund, Family & Consumer Sciences

DOWN TOWN CHIC
   Trosper, Ashley; Mentor: Andrea Eklund, Family & Consumer Sciences

OUTSTANDING CREATIVE PRESENTATIONS

MEI
   Ogawa, Emi; Mentor: Hal Ott, Music

DIES IRAE (MODERN DANCE PERFORMANCE)
   McLain, Tyler Elizabeth; Mentor: Therese Young, Health, Human Performance & Nutrition
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