

Newsletter LRES

College of Agriculture

Spring 2013

Congratulations Graduates!

This edition features the many ways LRES students, alumni, faculty, and staff pursue teaching, research and outreach excellence, creating experiences to prepare our students for their futures as professionals in the fields of land resources and environmental sciences. This year, we celebrate the graduation of 25 undergraduates across our majors and 11 M.S. and Ph.D. students, many of whom are starting jobs with environmental companies or government agencies or pursuing graduate studies. As you read through these pages, please join me in expressing our sincere thanks for many jobs well done. **Graduating students** - my congratulations to you and best wishes across all your future successes. Do remember to stay in touch!

~Tracy Sterling, Professor & Department Head

“Always remember, you have within you the strength, the patience, and the passion to reach for the stars to change the world.”

— Harriet Tubman

LRES Recognition

MSU Employee Recognition Awards



Each year the MSU Employee Recognition Awards program honors outstanding performance and contributions by MSU employees. This year LRES nominated Melody Schimpf for this award to recognize her extraordinary contributions to the department. Melody's nomination included comments praising Melody for her seemingly encyclopedic memory of accounts and university accounting regulations, to bringing humanity to the art of managing financial numbers, to her dedication, competency, and personable nature to the members of the department she serves, and everything in between. Melody's excellence was celebrated with other MSU employees from across campus at the annual ceremony on April 2.

MSU Award for Excellence



LRES celebrated the accomplishments of graduating senior, Collin Preftakes (Environmental Sciences: Soil and Water Science option), at the 31st Annual Awards for Excellence which recognized 40 students who had greater than 3.5 grade point average, demonstrated campus leadership and community service, and been nominated by faculty within their department. The award-winning students each selected a mentor who was honored with them at the event. Preftakes selected Professor Bob Peterson from LRES.

<http://www.montana.edu/cpa/news/nwview.php?article=11751&origin=homepage-1>

NACTA Award winner for College of Agriculture



Aiden Johnson received the Graduate Student Teaching Award of Merit for recognition of meritorious efforts in College Teaching at our LRES Graduation Celebration on May 3. The National Association of Colleges and Teachers of Agriculture (NACTA) Teaching Award of Merit recognizes those individuals whose efforts represent the very best in agricultural higher education and inspire all of us to achieve the highest levels of excellence. The department is proud of his commitment to student success and instructional excellence. Congratulations!

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LRES Recognition (continued)



Hally Berg took third place in the student paper competition with her presentation “The impact of tall buttercup (*Ranunculus acris*) on plant diversity and productivity”. At the Western Society of Weed Science conference in San Diego in March.



Christina Herron-Sweet took first place in the student paper competition with her presentation “Does spotted knapweed alter pollinator visitation in native plant communities” at the Western

Society of Weed Science conference in San Diego. **Christina** was also the recipient of a \$1000 student scholarship.



John Long published a paper with Paul Stoy entitled *Quantifying the periodicity of Heinrich and Dansgaard-Oeschger events during Marine Oxygen Isotope Stage 3 to Quarternary Research Journal*, a project he started while taking ENCS 465/565 and LRES 591.

View the article at: <http://www.sciencedirect.com/science/article/pii/S0033589413000215>



Tristy Vick-Majors and **Alex Michaud's** Antarctic research and field work at Subglacial Lake Whillans with WISSARD was showcased in a MSU News Service article *MSU Grad Students Part of Historic Expedition in Antarctica*.

View the full article here: <http://www.montana.edu/cpa/news/nwview.php?article=11639>

Tristy Vick-Majors and **Alex Michaud**, along with **John Priscu**, **Susan Kelly**, and **Rob Edwards**, were also featured in the MSU Alumni Association magazine, the *Collegian*, showcasing their work and historical expedition in Antarctica this year.



Adam Sigler was recognized for his water quality monitoring and watershed stewardship efforts with the 2013 Special Individuals Award from the Montana Wetland Council and the

Montana Watershed Coordination Council.



Tony Hartshorn was invited to lead an interactive “breathanalysis” segment for the ~700 attendees of the films *Chasing ice* (<http://www.chasingice.com/>) and *TRUST Alaska* (<http://vimeo.com/33921321>) at the Emerson Center

where a dozen participants witnessed the carbon dioxide and water vapor concentrations in their breath.



Jane Mangold received the Western Society of Weed Science (WSWS) Distinguished Achievement Award for Outstanding Weed Scientist Early Career – Public Sector, at the WSWS conference in San Diego in March.



Cliff Montagne was awarded the 2012 Lifetime Achievement Award at the student group NECO's (Network of Environmentally Conscious Organizations) annual Greenie Award ceremony.

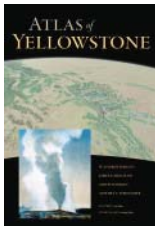


Fabian Menalled and **Zach Miller's** work on weed management was highlighted MSU News Service article *MSU fights wheat disease as part of six-state collaboration*. View the full article at:

<http://www.montana.edu/cpa/news/nwview.php?article=11607>



Bob Peterson was awarded the American Mosquito Control Association Presidential (AMCA) Citation for his exceptional work on the risk benefit of mosquito spraying and West Nile virus at the annual meeting of the AMCA this year. **Peterson** was also named Chair for the 2013 Science Policy Committee for Entomological Society of America (ESA); the ESA is the largest organization serving the professional and scientific needs of entomologists and people in related disciplines in the world.



Dave Ward, Tim McDermott, and

Bill Inskip were among significant contributors of scientific content to the *Atlas of Yellowstone* which won a top award this year from the American Publishers Association, the PROSE award for Excellence in Physical Sciences and Mathematics.

<http://www.atlasofyellowstone.net/>



John Priscu was invited to speak about “The Hidden World Beneath the Antarctic Ice Sheet” at TEDxBozeman; a local, self-organized event bringing people together in the spirit of ideas worth spreading. www.tedxbozeman.com

John Priscu and his lab group's research was highlighted in:

■ Nature: <http://www.nature.com/news/lake-drilling-team-discovers-life-under-the-ice-1.12405>

■ National Geographic: <http://news.nationalgeographic.com/news/2013/02/130205-antarctica-ice-life-moons-science-environment-lakes/>

■ New York Times: <http://www.nytimes.com/2013/01/15/science/wissard-project-seeks-signs-of-life-under-antarctica.html?ref=science>

Three of our LRES students were chosen as Ag Ambassadors for 2013-14, joining 12 other ambassadors from the College of Agriculture (COA) to recruit and retain students from across the state by helping them learn more about the exciting opportunities in our college. Congratulations to **Erik Anderson** (Soil & Water) from Helena, MT, **Tucker Colvin** (Enviro Biol) from Helena, MT and **Michaela O'Donoghue**, (Enviro Biol) from Santa Fe, NM. **Michaela** was also elected as COA Senator.



LRES Recognition (continued)

Promotion and Tenure



Paul Stoy



Stephanie Ewing

Left: (L to R) Lucy Marshall, Cathy Zabinski, and Lisa Rew at the MSU Promotion and Tenure ceremony.

Congratulations to **Lucy Marshall** and **Lisa Rew** for earning tenure and promotion to Associate Professor and to **Cathy Zabinski** for her promotion to Professor. Their achievements were recognized at President Cruzado's Celebratory Dinner on April 30th. Additionally, retention for **Stephanie Ewing** and **Paul Stoy** was awarded. Please take a moment to congratulate our accomplished faculty! Also, join us on **May 3rd at 5 pm at Colombo's** where we will continue our tradition of celebrating these milestones together.

GSO Activity: 3rd annual LRES Research Colloquium

The 3rd Annual LRES Research Colloquium was a huge success with record attendance of over 75 participants. Thanks to all the students who presented. We heard about a wide variety of fascinating research ranging from the discovery of living organisms in subglacial Antarctic lakes to the role of organic matter in sustainable agricultural systems to the metabolic interactions among inhabitants of hot spring microbial mat communities. Dr. David Carlson, founder and chief editor of the journal *Earth System Science Data* and previous director for NCAR, presented an interesting new framework for approaching environmental problems and stressed the importance of open source data for the future of environmental science. The talks were followed by posters that showcased the diversity of our department. Posters highlighted the interesting work occurring in all departmental fields including hydrology, agriculture, soil science, remote sensing, invasive plant ecology, microbial ecology and entomology. The quality and diversity of the work attracted attendees from multiple departments. Thanks to all the participants and the audience for sharing their knowledge and interest in environmental science!

The following day, Dr. Carlson also presented an intriguing lecture, entitled: *Humans in the Northern Hemisphere - What have We Wrought?*, on the impact humans have had in the northern hemisphere. This sparked a thought provoking question and answer session afterwards where Dr. Carlson suggested some changes that will need to occur in order to prevent further impact. Many students enjoyed the following social with Dr. Carlson where they discussed some of the most pressing issues in today's climate.



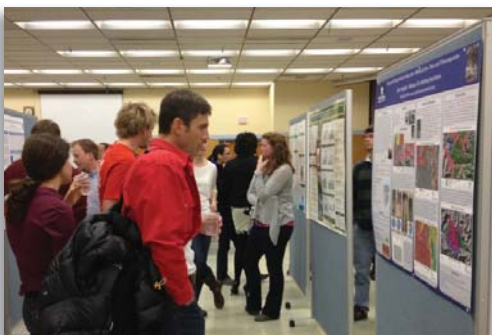
Master's student Hally Berg gives her research presentation entitled: *Understanding the Ecology and Integrated Management of Tall Buttercup (Ranunculus acris)*.



Above: A student takes notes on a presentation poster.



Right: Ph.D. student Karin Neff gives her research presentation entitled: *Carbon and Nitrogen Cycling in Mixed Vegetable Production*.



Students from around campus come to view the interesting posters presented by our LRES students.



Graduate student, Jason Wood, pays close attention to a presentation.

LRES in the Newspaper!



LRES student, Katie Noland, is featured planting a tree for Earth Day on the cover of the Bozeman Daily Chronicle.

Photo: BOZEMAN DAILY CHRONICLE/ADRIAN SANCHEZ-GONZALEZ

LRES Outstanding Senior Awards

Collin Preftakes



Collin graduates this semester with a B.S. in Environmental Science with a concentration in Soil and Water Science with Honors, and a minor in Spanish. For many of his years as an undergraduate, Collin has worked in LRES research laboratories. He has worked in the Comparative Bio-

logical Risk Assessment Laboratory since 2009. Before that, he worked in Dr. David Weaver's Wheat Stem Sawfly Lab for a year. During his time at MSU, Collin has for all intents and purposes performed as a seasoned graduate student, conducting independent research, presenting scientific papers at research conferences, and co-authoring two peer-reviewed journal articles. These are activities which we strive to provide our students; however, what is rare is that Collin has additionally published a peer-reviewed journal article as the senior author. Besides his undergraduate studies and research, he has been involved in many other pursuits including participation in several MSU clubs and as current president of the MSU Environmental Resources Club. Also, Collin has won several awards and scholarships, including the President's List and Dean's List, the Bill & Anita Jones Agriculture, Montana Wheat & Barley, and Land Resources Stewardship scholarships, and Steven L. Johnson Scholarship for Outstanding Achievement in Spanish. All of this recognition throughout Collin's undergraduate program culminated this year in his MSU Award for Excellence, only awarded to 40 MSU Seniors, and his feature photo on this semester's "Linked to Agriculture" publication. The Department looks forward to his continued success and working with him as he pursues his Ph.D. in Ecology and Environmental Sciences. - *Nominator, Bob Peterson*

Dylan Strike



Dylan is graduating with Highest Honors with a B.S. in Sustainable Food and Bioenergy Systems with an Agroecology concentration. He is from Pinedale, Wyoming and brings with him a strong work ethic and a keen appreciation for the places he has lived. This strong sense of place transformed into a

committed interest in local food production. Dylan was involved in the early stages of the 1000 Gardens Project, a small market garden operation that he and other students independently created while also doing their internship at Towne's Harvest Garden, and he joined another student in creating an exceptional short film on local food systems called "Bozeman Eats" (<https://vimeo.com/40781403>). Dylan became Dean Williamson's right-hand man in managing Dean's market garden farm in the Gallatin Valley and he was active in Network of Environmentally Conscious Student Organization (NECO), the Spanish Club, and Friends of Local Food student groups, all while being a student and working on an undergraduate research project studying the phenology of *Thlaspi arvense*. Dylan is highly regarded by his peers, instructors and employers, and continues to volunteer for Foodscape and Coffee-2-Compost which are non-profit groups in SW Montana. He has been a model student as an SFBS and LRES graduate, and was nominated by the LRES Scholarship Committee for Outstanding Undergraduate Student in the College of Agriculture. He is now the Farm Manager for the Three Hearts Farm in Bozeman, where we wish him the best and every continued success in his future accomplishments and contributions in the area of sustainable food production. - *Nominator, Bruce Maxwell*

LRES 2013 Undergraduate/Faculty Retreat

LRES undergraduate students and faculty gathered for a spring semester retreat with a night of food and fun, and a day of cross country skiing.

Undergraduate students and faculty from the Land Resources and Environmental Sciences Department gathered to kick off the spring semester with a winter retreat on February 1-2 at Homestake Lodge in the Highland Mountains between Whitehall and Butte. Students and faculty enjoyed tasty food, lively conversation and games on Friday evening. Saturday morning began with some participants warming up the trails with an early morning cross-country ski. After breakfast everyone geared up for a day of cross-country skiing on the beautifully groomed trails around the lodge. The students and faculty had a great time getting to know each other better and sharing the wintertime beauty of Montana's mountains. The retreat was made possible with a grant from Provost Martha Potvin in support of building community between undergraduate students and faculty. ~*Jane Mangold*



Left: Students and faculty sit down for dinner at the Homestake Lodge



Right: After breakfast the group lined up for a photo before hitting the trails

Faculty Spotlight: Perry Miller



Dr. Perry Miller is a professor of sustainable cropping systems with active field research and teaching focused strongly on crop diversification in the semiarid northern Great Plains. With help from several MSU colleagues, water and resource-use-efficiency, economics, and soil carbon and nitrogen management are studied in the context of no-till or organic farming systems. A special emphasis of Dr. Miller's has been pulse crop ecology since pea and lentil (and to lesser extent, chickpea) have proven to have a strong rotational fit within dryland wheat production. Pulse crop production once trivial in Montana now exceeds a half million acres annually due to a concerted effort by several MSU researchers. A February pulse crop Extension day in Conrad drew 250 growers, half of whom had never grown pulse crops. Pulse crops are versatile, being grown for food, feed, forage, and even 'fuel'. Recent crop energy budgets conducted by Ph.D. student Mac Burgess showed that nitrogen fertilizer is the dominant energy input in Montana's wheat systems. Pulse crops in rotation with wheat change energy metrics both by making wheat more productive for a given set of inputs, and by offsetting a portion of nitrogen fertilizer. Dr. Miller teaches AGSC 428 / LRES 529 *Sustainable Cropping Systems* and co-teaches LRES 528 *Bridging Principles and Practices of Sustainable Cropping Systems*. Largely due to the popularity of the recently convened Sustainable Food and Bioenergy Systems cross-college program, enrollment in AGSC 428 has soared from 10–15 students every other year to 30–35 students every year.

Perry received a Master's degree in Crop Science at the University of Guelph (Canada) and a Ph.D. in Agronomy and

Plant Genetics from the University of Minnesota. Hailing from Saskatchewan, he joined LRES in 1998 to initiate his Cropping Systems Research Project. With the very able help of Research Associate, Jeff Holmes, this project has grown more than 25 crops in various research scenarios around Montana. Graduate research projects (Mac Burgess, Justin O'Dea, Susan Tallman) have focused on the use of green manure crops for greening the summer fallow period in the Golden Triangle region of Montana, and integrated crop–livestock strategies for organic systems (Stephen Johnson).



Growers listening intently during Dr. Miller's pulse crop presentation.



Wheat test plots at different N fertilizer rates following pea and lentil green manures, Amsterdam, MT, 2011.

LRES Graduate Launches Biofuels Startup Company - Summary of Bozeman Daily Chronicle article

http://www.bozemandailychronicle.com/news/montana_state_universityarticle_080e0d68-7a57-11e2-b40c-001a4bcf887a.html

LRES graduate Dr. Mark Kozubal is partnering with MSU in his local biofuels startup company, called *Sustainable Bioproducts*, to turn a fungus discovered in the highly acidic hot springs of Yellowstone National Park into sustainable energy. The fungus, called MK7, was discovered in the Yellowstone geyser basin in 2009. Kozubal and co-inventors LRES professors Bill Inskeep and Richard Macur have filed a patent and found that MK7 not only thrives in hot springs, but it also eats algae and, when dried, oozes oil.

Sustainable Bioproducts is funded by a NSF Small Business Innovation and Research grant to investigate the feasibility of using this organism for biofuels production.



Hot springs, Yellowstone National Park

New Research Faculty

Please welcome the following new LRES research faculty!

Dr. Ryan Jones



I am a microbial ecologist but I approach my research from the perspective of an evolutionary geneticist and rely heavily on molecular data. The frequent advances in genomic techniques and the abundance of information they provide fascinate me, and I try to incorporate the latest technological and analytical advances into my research. I have focused on the application of community phylogenetic techniques (largely developed by plant and animal evolutionary biologists) towards a greater understanding of microbial ecology. This work is particularly exciting because it integrates a number of disparate disciplines, namely, evolutionary genetics, microbial ecology, ecosystem ecology, and computer science. Furthermore, because microbial communities form intimate associations with other organisms, studying microbes demands a familiarity with a suite of other organisms as well.

Most recently, I was in the Department of Environmental Science at the University of Sydney where I studied rhizosphere and soil bacterial communities using high-throughput DNA sequencing and fluorescence-assisted cell sorting. Prior to that, I was an American Society for Microbiology Postdoctoral Fellow performing experimental plague research in the Division of Vector-Borne Disease at the Centers for Disease Control and Prevention. I received my PhD in 2009 from the University of Colorado; I was trained in an evolutionary genetics lab and my dissertation focused on using phylogenetic analyses to better

characterize and compare microbial communities of disease vectors and soil.

At the moment, I am especially interested in how environmental and historical factors govern microbial assemblages and how environmentally driven shifts in microbial community composition alter community function. I am particularly excited to be involved in the research spearheaded by other MSU researchers taking place in the Tenderfoot Creek Experimental Forest; as one of the most heavily instrumented watersheds in the world, it provides an amazing opportunity to link hydrological processes, biogeochemistry, gas fluxes, and microbial dynamics. A major objective of mine at MSU is to work with ecosystem ecologists, biogeochemists, and landscape hydrologists to better understand feedbacks between ecosystem processes and microbial dynamics.

As an Assistant Research Professor, I don't have any immediate plans to teach courses, but I hope I can still be useful to the students in LRES. I am happy to share my expertise with high-throughput DNA sequencing and with the bioinformatics necessary to make sense of the data. I imagine that my molecular and analytical skills could be useful to many graduate students in LRES and I look forward to collaborating with them.

Dr. Jane Klassen



I am directing the Environmental Analytical Laboratory. My goal is to ensure that this facility enables users to make

the accurate and precise, quantitative measurements that their research projects demand. With a background in physical and analytical chemistry, I have spent the past six years on the instructional faculty both at MSU and at the University of Maryland, College Park (UMCP). My responsibilities have included teaching Physical Chemistry Laboratory, Advanced Instrumental Analysis and Quantitative Analysis. I was also involved in curriculum development efforts at UMCP that led to a bioanalytical laboratory sequence. This sequence became a foundational course for undergraduates in chemistry, biochemistry, chemical engineering and biology.

Prior to starting a career in academia, I was the Associate Director of the Mass Spec Data Center at the National Institute for Standards and Technology (NIST – Gaithersburg). In that capacity I oversaw the acquisition, purchase, and evaluation of data for inclusion in the Mass Spec Database. As a post-doc at SRI International, I studied the chemistry of atmospheric systems, specifically the physical properties of stratospheric aerosols. My Ph.D. research at University of Wisconsin, Madison focused on the reactivity of gas-liquid interfaces using both molecular beam techniques and traditional surface tension measurement. I received my undergraduate degree in chemistry from Carleton College.

The overall emphasis of my research interests and professional activities has been to understand the chemistry of environmental systems. In particular, I have an enduring interest in the fate of molecular species adsorbed to environmentally relevant liquid and solid interfaces including the surfaces of aerosols, minerals and surface water. I look forward to working closely with PIs, students, post-docs and research staff so that we can all benefit from making reliable measurements that

New Research Faculty (continued)

address important questions in environmental science. Given the breadth and depth of research activity in LRES and the scope of environmental research being performed elsewhere on campus, I hope and expect that the Environmental Analytical Laboratory will become an asset to all faculty in LRES as well as a centerpiece facility for MSU.

Dr. Zach Miller



My research is focused on improving the productivity and sustainability of agricultural systems by understanding the ecology of these systems and applying these insights to improve pest management. I am involved in a variety of collaborative and interdisciplinary projects that address this topic. Much of my research focuses on the interactions between plant pests (herbivores and pathogens) and plant populations and communities and how management affects these processes.

Part of this research is being conducted on mite-transmitted cereal viruses that are the most common and damaging viral diseases in cereal crops in the Great Plains. The traditional approaches to disease management (pesticides and breeding resistant crops) have been largely ineffective for this pest complex. Adding to the challenge in controlling these diseases, these viruses and their vector survive on a wide range of non-crop grasses that can serve as reservoirs for disease. We are working to improve management of this disease by: 1) quantifying the risk of disease transmission from non-crop grasses to cereal crops and using this knowledge to understand what characteristics of these grasses determine the impacts on disease risk; 2) examining how fertilization and other management factors impact disease spread and impacts on yields; and 3) demonstrating the costs and risks of pesticide-use on this disease complex. I am also involved in research on how pathogens affect weed-crop competition and weed invasion, the effects of organic and conventional management practices and cropping systems on weed and pathogen communities and their impacts on crops, and the population ecology and control of perennial weeds in

organic systems.

I have a broad background in plant population and community ecology. Before coming to MSU, I earned my PhD at the University of Michigan. My thesis work focused on how plant enemies (pathogens and herbivores) act to maintain plant diversity in native plant communities. Before my doctorate, I toured the world working in ecological research. I've worked on projects in the deserts of Utah, the tall-grass prairies and farm fields of the Midwest, and the tropical forests of Central America and the Amazon basin. Prior to my work as a traveling ecologist, I received my B.S. in Biology from Luther College in Northeast Iowa.

I'm excited to be a part of LRES and the College of Agriculture. Addressing the challenges that face agriculture in the 21st century requires collaboration between scientists from different fields and producers. At MSU, I've been really impressed by the motivation to form such partnerships and tackle these problems. I'm also enthusiastic about getting undergraduate and graduate students engaged in these issues especially through hands-on research experience.

ENSC460 (Soil Remediation) Students Study the Construction Trench Behind Leon Johnson Hall

An energy retrofit project for Leon Johnson in Fall 2012/ Spring 2013 provided a hands-on-soil opportunity for ENSC460 (Soil remediation) students via ~400 feet of exposed trench walls. From their vantage point outside the trench, students were asked to note differences in A horizon depths, rock fragments, colors, and texture. One take-home message: those textbook examples of soil profiles with clear and horizontal horizon boundaries are an oversimplification of real-world variability, which all students had an opportunity to experience. ~Tony Hartshorn



ENSC460 students have a hands-on experience probing around the construction trench analyzing the trench walls.

Two LRES professors attend 5th Extended Learning Institute (XLi) Conference in Billings, MT

Scott Powell and Tony Hartshorn drove east through a late winter storm to attend the 5th annual XLi Conference (<http://www.msubillings.edu/xli2013/>). The conference drew a dozen representatives from across the MSU-Bozeman campus, as well as an additional five dozen educators from other MUS institutions and regional schools.

The conference started out with several bangs—not the least of which was an opening keynote by Michael Wesch, from Kansas State University. His wide-ranging presentation “Inspiring wonder in the age of whatever” seemed like a TED talk and was punctuated by a seismic amount of noise courtesy of a demolition project literally 30 feet behind the screen. Unfazed, Dr. Wesch, who was a 2008 US Professor of the Year, reviewed the transformation of academia from a time before “knowledge machines” saturated campuses and teaching relied on a formulaic “What? How? Why?” sequence to today, when “knowledge machines” such as smartphones work best if we flip that approach to “Why? How? What?” Without a motivating “Why?” question, as we all know, those “knowledge machines” can be quite the distraction. He encouraged all of us to reframe our teaching from an “instruction” model to more of a “construction” model where vulnerability, risk-taking, and failure are encouraged.

Several informative sessions followed, including sessions on the MSU-Bozeman campus’s newly unveiled Technology Enhanced Active Learning classroom, experiential online

learning, how video games and learning can come together, and comparing online and physical classrooms.

The closing keynote was delivered by George Siemens, author of *Knowing Knowledge* and an upcoming book on *Massive Online Open Courses*. Dr. Siemens’ talk (<http://www.slideshare.net/gsiemens/complexification-of-higher-education>) outlined some scenarios for academia. When asked to comment on the opening keynote directive to bring wonder back into the classroom, Dr. Siemens replied “I wonder what universities will look like” in the future. His talk outlined five “futures” for academia: 1. the status quo; 2. serving as accreditors (“teach globally, accredit locally”); 3. a localized/specialized model (“study locally”); 4. corporate partnerships (e.g. Arizona State University); and 5. a net model where a university serves as a new integrator of knowledge.

It was great to network with regional educators, including many from our own campus. We appreciated the opportunity to contextualize our own efforts to engage students, both on campus and online, and we found the keynote talks in particular to be quite provocative. Perhaps the student in a 2007 Wesch video (“A vision of students today”) who displays a handwritten message (“When I graduate I will probably have a job... that doesn’t exist today”) could be speaking for our very own LRES students! ~Scott Powell

WISSARD Update

After a decade of international and national planning, and three and a half years of project preparation, the WISSARD project successfully accessed and sampled Subglacial Lake Whillans, 800 meters beneath the West Antarctic Ice Sheet. The project was led by LRES faculty member and Chief Scientist Dr. John Prisco, and included a team of seven people from MSU. Field sampling was intense and exciting, due to the extraordinary efforts of many scientists, support and outreach staff and a talented drill team. LRES graduate students, Tristy Vick-Majors and Alex Michaud were members of the field team, and collected lake water and sediment samples - the first to ever be collected intact from an Antarctic subglacial aquatic environment. Sample processing is ongoing at MSU, and the team is planning for the second field season beginning in November 2013, where we will sample from additional locations on the Whillans Ice Stream and expand our outreach program on the ice. ~Susan Kelly



Custom-built mobile science labs were on site in the field so that scientists like Ph.D. student Tristy Vick-Majors, can prepare samples and complete sensitive microbial and geochemical analysis in the field.

The WISSARD geomicrobiology team sitting inside the ice cave that was constructed to hold samples during field deployment.



LRES Ph.D. student Alex Michaud dispensing Subglacial Lake Whillans sediment getting ready to do an experiment in the field.

CISM Technical Webinar Series

The Center for Invasive Species Management (CISM) presented a three-part invasive plant management technical webinar series in March 2013. Sponsored by DuPont, the free webinars provided 240 local, state and federal agency land managers, conservation district personnel, and private applicators from 22 states with science-based information on the technical merits of herbicides and other control methods to aid in the decision-making and approval processes for on-the-ground invasive plant management efforts.

Each free, half-day webinar focused on a particular region of the United States: the Pacific Northwest, Greater Southwest, and High Plains and Intermountain West. Leading experts from universities, federal agencies, suppliers, and DuPont provided stewardship and technical background information on the most effective new and existing herbicides for controlling target invasive plants in each respective region, thus enabling economical site rehabilitation and restoration.

Webinar participants: (1) increased their ability to effectively remove invasive plant species that threaten commerce, public safety, recreation, wildlife habitat, and wildland health while complying with state and federal laws; (2) learned about the best integrated management tools available for conserving healthy ecosystems and sustaining desired populations of forbs, shrubs, trees, and grasses; (3) improved their ability to

achieve restoration and conservation outcomes that are resilient to wildfire, inhibit erosion, and promote water quality—in a financially responsible, cost-effective manner—by selecting the best available herbicide tools; (4) improved the overall efficiency, effectiveness, and environmental sensitivity of herbicide applications; and (5) obtained control information, expert contacts, and resources that will improve their ability to manage invasive plants in their region.

CISM secured pesticide re-certification and continuing education credits for 81 webinar participants in 11 western states.

So successful and well received were these webinars that plans are already in the works for subsequent webinars in 2014 in both the eastern and western U.S. Recordings of the webinar presentations and technical reading materials are available on the webinar series website: www.weedcenter.org/technicalwebinars.



Partial screen shot of the CISM Technical Webinar Series.

Fire Model Workshop



Kim Taylor doing field work in the Canterbury Region of the South Island of New Zealand earlier this year.

In December I attended the Missoula Fire Sciences Lab, Wildland Fire Assessment Tool (WFAT), and WildfireBGCv2 workshop. The workshop was run by fire experts from the USFS Missoula Fire Sciences Lab and the National Inter-agency Fuels Technology Transfer Team. The workshop opened with interesting and creative ways to teach fire science to school children through the FireWorks program including many hands-on games and demonstrations (the curriculum is online at www.firelab.org/science-applications/science-synthesis/75-fireworks). The education section was followed by various workshops on the powerful and useful models and tools that the Fire Lab has developed to help predict fire behavior, fire effects and the impact of fire management practices (models include First Order Fire Effects Model (FOFEM) and FuelCalc which are also available free online). WFAT is an

ArcGIS toolbar that provides an interface to connect ArcGIS, FlamMap3 and FOFEM in order to spatially predict fire behavior and first order fire effects across a landscape. The last section of the workshop focused on understanding how the process based Fire BGCv2 model can help predict changes to landscapes and forest composition with changes in climate and fire frequency. The attendees were both fire scientists and fire managers hoping to use science to improve their management. Many of the models we learned about will be incredible useful in my dissertation research which is addressing the impact of lodgepole pine invasions on fire behavior and effects in New Zealand and Patagonia. Overall it was very interesting and exciting to see the progress that has been made in modeling fire behavior and predicting its impacts on various ecosystems.

~ Kim Taylor

Collecting data on fuel loads in sites invaded by the introduced lodgepole pine.



LRES Graduating Seniors

Bachelor Degrees 2012/2013

Fall 2012

Aaron Butler

Environmental Sciences –
Environmental Biology

Sam Carlson

Environmental Sciences –
Environmental Biology

Maxwell Moran

Environmental Sciences –
Environmental Biology

Megan Podolinsky

Environmental Sciences –
Environmental Biology

Ryan Richardson

Environmental Sciences –
Environmental Biology

William Moore

Geospatial & Environmental Analysis

Olin Erickson

Sustainable Foods & Bioenergy
Systems – Agroecology

Spring 2013

Connor Bailey

Environmental Sciences –
Environmental Biology

Megan Primmer

Environmental Sciences –
Environmental Biology

Hailey Buberl

Environmental Sciences –
Environmental Biology

Collin Preftakes

Environmental Sciences –
Soil & Water Sciences

Michael Ruiz

Environmental Sciences –
Soil & Water Sciences

Laura Whitmore

Environmental Sciences –
Soil & Water Sciences

Cansu Gumus

Environmental Sciences –
Policy and Management

Gunduz Kocabas

Environmental Sciences –
Policy and Management

Stephen Lesky

Geospatial & Environmental Analysis

Scott Peters

Geospatial & Environmental Analysis

Dylan Strike

Sustainable Foods & Bioenergy
Systems – Agroecology

Edward Cope

Land Rehabilitation

Katherine Genest

Land Rehabilitation

Christian Larson

Land Rehabilitation

Brackett Mays

Land Rehabilitation

Andrea Pierson

Land Rehabilitation

Sarah Ricard

Land Rehabilitation

Jordan Westenberg

Land Rehabilitation

Graduate Degrees 2012/2013

**Ph.D. Ecology &
Environmental Sciences**

Summer 2012

Christian Klatt

M.S. Entomology

Spring 2013

Rex Davis

Paramjit Karam Singh

M.S. Land Rehabilitation

Summer 2012

Dustin Anderson

**M.S. Land Resources &
Environmental Sciences**

Summer 2012

Russell Smith

Fall 2012

Padraic Stoy

Spring 2013

Krista Ehlert

Bahram Farokhkish

Katie Kleehammer

Aaron Rains

Chris Welch



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