LRES Newsletter

The College of Agriculture — *Fall 2014*

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MONTANA STATE UNIVERSITY
College of AGRICULTURE

Land Resources and Environmental Sciences
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A Note from Our Department Head

Please enjoy perusing this fall's departmental newsletter, which highlights some of our many research, teaching, and service pursuits. We currently enroll 136 undergraduate students, 76 M.S. students, and 27 Ph.D. students. We want to congratulate our graduates who have completed their studies this fall. Best wishes to you in your future endeavors!

Tracy Sterling, Professor & Department Head

New Faculty Member

Dr. Scott Powell, Assistant Professor of Geospatial Sciences

It might come as a surprise to some of you that I am a "new" faculty member in LRES. After all, I have been at MSU since 2000, first as a graduate student in Ecology, and then as a research faculty member in the department from 2009 onwards. But yes, I am now a tenure-track faculty member, and I'm really eager to get started!

My personal background includes growing up in Connecticut and heading "west" to attend college at Macalester College in St. Paul, MN. Following undergrad, I volunteered for AmeriCorps in Vermont and the Student Conservation Association in Texas, and then went back to graduate school for a Master's degree in Environmental Management from Duke University. After that, I worked as a GIS analyst for the Forest Service at the Rocky Mountain Research Station in Fort Collins, CO, which eventually led me to Bozeman where I completed my Ph.D. in Ecology focusing on remote sensing of forest dynamics in the Yellowstone region. Apart from a three-year postdoc with the Forest Service at the Pacific Northwest Research Station in Corvallis, OR, I've been at MSU ever since.

My research interests revolve around characterizing landscape and vegetation patterns to improve understanding of the drivers and ecological consequences

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LRES Recognition




Jim Bauder, professor emeritus, **Stephanie Ewing**, **Tony Hartshorn**, **Cathy Zabinski**, and alum **Russell Smith** (not pictured) have contributed to the research surrounding the remediation at Hailstone National Wildlife Refuge. The remediation project commenced in 2011 when the federal government removed the earthen dam that contributed to high selenium concentrations in Hailstone NWF's reservoir


Jane Mangold and **Fabian Menalled**, along with their colleagues in the MSU Extension Climate Science Initiative Working Group, received the Visionary Leadership Award from the Montana chapter of Epsilon Sigma Phi, a national fraternity of Extension educators.

Perry Miller joined the ranks of a select 0.3 percent of American Society of Agronomy (ASA) active and emeritus members when he was named an ASA Fellow. He was recognized during the society's International Annual Meeting in November.


Rob Payn published a primary-authored paper titled "A generalized optimization model of microbially driven aquatic biogeochemistry based on thermodynamic, kinetic, and stoichiometric ecological theory" in *Ecological Modeling*. **Geoff Poole** co-authored the paper. The paper is available online at www.sciencedirect.com.

Bob Peterson received the 2014 Distinguished Alumnus Award from the Lawrence Brunner Entomology Club at University of Nebraska, Lincoln, where he earned both his master's and doctoral degrees in Entomology. Peterson was also named "Most Valuable Professor" at the October 3rd Bobcats football game.

John Priscu co-authored a breakthrough paper on WISSARD's discovery of the first direct evidence of life in subglacial lakes in Antarctica. The paper was published in the August 21, 2014 edition of *Nature*. Various news sources across the country published reports, and CBC's (Canada) radio science program featured an interview with Priscu. Priscu was also awarded the Edward O. Wilson Biodiversity Technology Pioneer Award for his contributions to science.

David Weaver was inducted into the National Association of Inventors (NAI). He and other MSU inductees were recognized in a ceremony held at MSU in September.


John Long published a primary-authored paper titled "Peak tornado activity is occurring earlier in the heart of 'Tornado Alley'"in *Geophysical Research Letters*. **Paul Stoy** co-authored the paper. The paper is available online at www.agu.org.

Melody Schimpf, fiscal manager, attended a national conference in Reno, NV on grants and procurements rules and procedures.

Linda McDonald, Academic Programs Coordinator, was nominated for the Academic Advising Award through the Center for Faculty Excellence.

Patrick Lawrence, a graduate student, earned an Institute on Ecosystems fellowship to lead a summer science internship at Chief Dull Knife College in Lame Deer, MT. See "Ecology, History, and Culture" on page 5.


Alex Michaud, a graduate student, published a primary-authored paper titled ""Biological ice nucleation initializes hailstone formation" in the *Journal of Geophysical Research: Atmospheres*. His research was sparked by the devestating hailstorm that hit Bozeman in June 2010. **John Priscu** (pictured previously) and **John Dore** are among the co-authors.

Get department news first.
Follow us on Facebook to see press releases, seminar announcements, other student and faculty news and reminders, and photos of department events.

Find us on Facebook

Undergraduates Receive IoE Summer Internships

Three undergraduate students received summer internships with the Institute on Ecosytems to conduct research:

Erik Anderson: using water isotopes to link water and solute movement in cultivated and uncultivated soils - Judith Basin. Erik is majoring in Soil and Water Science and was advised by **Stephanie Ewing**.

Noelani Boise: assessing the effect of change in temperature and precipitation on a cheatgrass-invaded rangeland - Red Bluff Research Ranch, Norris. Noelani is majoring in Environmental Biology and was advised by **Lisa Rew, Erik Lehnhoff,** and **Tim Seipel**.

Chance Noffsinger: the response of an invasive annual and native perennial grass to different climate and nitrogen scenarios - MSU. Chance is majoring in Environmental Biology and was advised by **Lisa Rew, Erik Lehnhoff,** and **Tim Seipel**.

New Faculty Member: Scott Powell

Continued from page 1

of change. An example of this from my current work is mapping forest disturbance dynamics (e.g. fire, insects, and harvest) across the United States and modeling the associated changes in forest biomass.

In particular, I examine the dynamics of carbon sources and sinks across space and time and within diverse systems, from forest ecosystems to agricultural systems, as well as engineered geologic sequestration sites. A core theme of my research is the utilization of geospatial data and tools (e.g. remote sensing, GIS, and GPS) to develop monitoring systems at multiple scales for a wide variety of applications in environmental science.

On the teaching front, I am currently the Program Coordinator for the online M.S. in LRES program. My responsibilities in this position include teaching one course per semester (Landscape and Ecosystem Ecology; Remote Sensing Applications in Environmental Science), advising graduate students, providing programmatic and curricular oversight, coordinating teaching efforts within the program, and serving as a point of contact between LRES and Extended University. In addition, I co-teach an undergraduate Honors seminar that deals with climate change science and policy. Starting next year I will also contribute to co-teaching an undergraduate LRES course (ENSC 110) as well as a new graduate course.

I'm really excited about my "new" start in LRES. We are such a diverse and unique department, and I feel right at home here and grateful for the opportunity to contribute.

Scott Powell

New LRES Staff

Jake Colberg joined LRES in September. He works part-time to provide IT support to the department. He is an undergraduate studying Computer Science.

Katie Fogg graduated from the Ecology department with a B.S. in Biological Sciences: Organismal Biology in Summer 2013. Katie works in the Fluvial Landscape Lab as a Research Associate.

John Long completed his Ph.D. in Ecology and Environmental Sciences in Spring 2014. He is now working as a Research Scientist in the Spatial Sciences Lab.

George Schaible joined LRES in the summer of 2014. He graduated from the Microbiology department with a B.S. in Biotechnology, as well as minors in Astrobiology and Biochemistry. He works as a Research Associate in Dave Ward's lab.

Julie Witte works at the front desk in the administrative office. She joined LRES in May 2014. She is originally from Bowmanville, Ontario, Canada and holds a B.A. in General Studies: Language and Linguistics from Dordt College in Sioux Center, Iowa.

LRES Hosts 11th Annual Crops and Weeds Field Day at the Post Research Farm

On July 8, more than 130 farm managers, crop advisors, students, and researchers visited the Montana State University's Post Research Farm to learn about ongoing crop and weed research programs at MSU. This is our 11th Crops and Weeds Field Day and this year it was organized in conjunction with the Western Society Crop Science conference held in Bozeman.

This year's speakers were **Jane Mangold**, **Fabian Menalled**, **Ed Davis, Erik Lehnhoff**, and Erin Burns on weed management; Alan Dyer on cereal pathogens, Chengci Chen on pulse crop production, Kent McVay on crop rotations, **Hilary Parkinson** and Eva Grimme on pest identification, and Luther Talbert on spring wheat breeding.

Attendees enjoy a presentation at the Post Research Farm

LRES also co-hosted a discussion with former rear admiral David Titley on climate change, agriculture, and national security.

As always, registration was free and LRES co-sponsored with PSPP to provide refreshments, breakfast, and lunch.

Fabian Menalled

Bozeman Magazine Features GPS Class' Service-Learning Project

The Spring 2014 edition of the LRES Newsletter included recognition of **Diana Cooksey**'s receipt of the President's Award for Excellence in Service Learning for her E-911 mapping project.

Cooksey's TA, Danielle Martin, submitted an article on the project to *Bozeman Magazine*. The article highlights the project's value, both to students as they learn GPS and GIS mapping technology and apply it to real-world situations, and also to the City of Bozeman, whose firefighters use the students' maps to locate the scene of an emergency more efficently, particularly in high-density residential developments.

The article is available at www.bozemanmagazine.com; search for "Service Learning 101."

Research in Pictures

Sean McKenzie, who completed his graduate studies in Summer 2014, obtains samples from a wheat field

Professors Stephanie Ewing and Rob Payn look on while undergraduate Simon Fordyce collects samples as part of a diel experiment for the water and nitrogen dynamics and sourcing project in the Judith River Watershed of central Montana

Photo: Adam Sigler

Ecology, History, and Culture

Patrick Lawrence Teaches and Learns Alongside Students in Lame Dear, MT

For six months in the summer of 2014, I had the opportunity to work at Chief Dull Knife College (CDKC) in Lame Deer, MT, as the result of an Institute on Ecosystems graduate fellowship. CDKC is one of seven tribal colleges in Montana, and serves as a hub of higher learning for the Northern Cheyenne Tribe. My charge was to establish and lead a summer science internship program for ten tribal college and seven native high school students.

Over the course of the summer, the students and I spent time learning about the local ecology - from plants, to water quality, to infectious diseases (West Nile). Along the way, a mix of tribal college faculty and community members joined us on our outings, including several guest instructors from MSU (**Bruce Maxwell**, **Lisa Rew**, **Kimberly Taylor**, and Laurie Stahl). At the end of the summer, students reflected on their summer experiences by making posters, sampling our home-grown garden vegetables, and flying the unique CDKC sampling blimp! Although the students were exposed to a variety of science disciplines and activities over the summer, I am sure that I had an equally valuable learning experience. Six months may sound like a lot within the span of a graduate degree, but it is relatively little time to understand the history, culture, and people of the Northern Cheyenne. Nevertheless, I am grateful for my experience, and I look forward to seeing some of my students from CDKC when they enroll at MSU and on future trips to Lame Deer.

Patrick Lawrence, ECES Ph.D. student and IoE Fellow

Professional Spotlight

Megan Hofland, Research Associate in the Weaver Lab

A fifth generation Montanan, I grew up in the foothills of the Little Belt Mountains, and I moved to Bozeman in 1998 to study biology. I began working in Dr. David Weaver's lab in 1999 and have spent the subsequent 15 years working on plant/insect interactions, primarily focused on the wheat stem sawfly and its associated impacts on the state's cereal crops.

Research in the lab involves the collection and evaluation of plant, insect, and chemical samples. I troubleshoot, maintain, and train others to use a Volatile Collection System, GC/MS, GC/FID, and Y-tube Olfactometer. These equipment are used to collect and evaluate chemical samples, then investigate the role of the compounds on insect behavior.

I came to the Gallatin Valley to go to college, and I stayed, because I love the area. Like many here, I spend my spare time outdoors hiking and camping with my family. I appreciate the opportunities that my employment at MSU has provided: challenging research projects and ample opportunity for recreation.

Megan Hofland

Research in Pictures

Undergraduate Kaylee Schmitz collects samples for a study on ammonia volatilization in Coffee Creek, MT

Photo: Rosie Wallander

We'd love to hear from you! If you are (or once were) a faculty member, staff member, or student and wish to share your research and/or professional accomplishments in an upcoming newsletter, please contact:

- **Tracy Sterling**, Department Head, tracy.sterling@montana.edu
- **Julie Witte**, Administrative Associate, lresfrontdesk@montana.edu

SFBS Students Experience Agriculture in the Atlas Mountains of Morocco

In 2014 students from the SFBS (Sustainable Food and Bioenergy Systems) program traveled to the rural community of Zawiya Ahansal in the Atlas Mountains of Morocco to engage with local people and learn about their agriculture and nutrition. The course is run in cooperation with the Atlas Cultural Foundation, a Livingston-based community development non-profit that has worked in Zawiya Ahansal since 2006. The students traveled with Dr. **Tim Seipel** from the Land Resources and Environmental Sciences department and Dr. Carmen Byker from the Health and Human Development department. During the trip, students learned about cropping systems, area soils and climate, and worked with locals in their gardens to produce food that was ultimately distributed to locals in need. Through community events, students also learned about the diets and nutrition of locals, where the food is produced, and how food is stored and handled.

SFBS students analyze soils in the edge of a local garden in Zawiya Ahansal, Morocco.

The agriculture in Zawiya Ahansal consists of growing vegetables and other crops on flood-irrigated, terraced fields in river flood plains, and grazing sheep and goats in mountain pastures. The main crops are six-row barely, alfalfa, and corn, all of which are used for animal fodder.

SFBS students interview local farmers in their fields in Zawiya Ahansal, Morocco during a study abroad trip in June 2014.

The course will be offered again in 2015, and students will engage with the community on a variety of issues including pest-management, and trials with vegetable crops to improve local nutrition. For more information, or to download application materials, visit http://www.atlasculturaladventures.com.

Tim Seipel

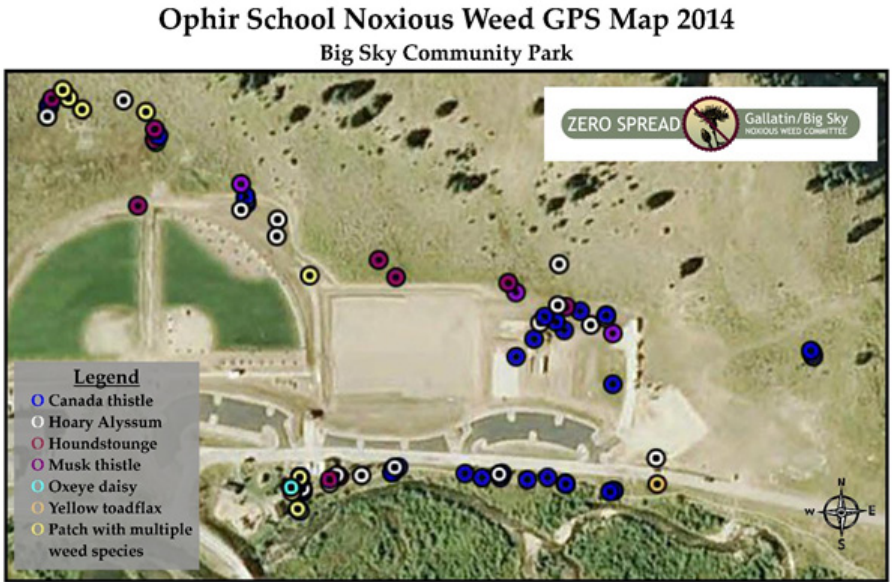
Ophir School 2nd Graders Brush Up on Weed ID and Participate in Weed Pull

What do you get when you have 35 pairs of size small gloves, Montana Noxious Weed ID booklets, massive black garbage bags, shovels and 35 weed savvy 2nd graders? The annual Ophir 2nd grade weed pull at the Big Sky Community Park in Big Sky, Montana! Every fall, Ophir Elementary School 2nd grade teacher Brittany Shirley teaches her class how to identify Montana's noxious weeds, why students should care about them, and what they can do to help control these invasive plants. Then a field trip is arranged, chaperones and volunteers are contacted and a date is set for the weed pull. This year, the event took place on October 6th, and I had the pleasure of being one of those volunteers who participated.

I am the Project Coordinator for the Montana Noxious Weed Education Campaign (MNWEC), a partnership among multiple federal, state, and county agencies, non-governmental and educational organizations, and private citizens that is housed within the LRES Department. One of my duties is to help organize and participate in educational events that focus on noxious weeds, such as the Ophir 2nd grade weed pull. MNWEC's mission is, "To educate the people of Montana about the economic and environmental impacts of noxious weeds while encouraging the public to participate in ecologically based integrated weed management."

The morning started out with the Gallatin/Big Sky Weed Coordinator, Jen Mohler, giving a brief presentation to the kids about the weeds they might find around the park as well as why it's important to always check your shoes and clothes after recreating to help stop the spread of weed seeds that may have hitched a ride on you. Then the fun began; the kids were put in teams with chaperones, given gloves, a GPS unit, black garbage bags and sent on their way! Once a weed was found, the group would identify it and map it using a GPS unit. The maps generated by the students' work will be used to monitor and apply follow-up treatments as necessary next spring. The group then worked to pull, dig and bag the weeds that were found. Species found around the park included Dalmatian toadflax, oxeye daisy, hoary alyssum and musk thistle. Not only were the kids learning and pulling, the adult chaperones and parents were doing the same!

A student carries his "trophy weed"



The map generated using the GPS points that were collected by the 2nd grade class

The weed pull was a great success as evidenced by 300-350 pounds of weeds that were collected in just a few short hours. Prevention is key when it comes to noxious weeds, and these types of events are a great way to raise community awareness about noxious weeds. By involving youth and their parents, events like these foster an understanding of natural resources and encourage active participation in weed management efforts.

Shantell Frame-Martin, Project Coordinator for the Montana Noxious Weed Education Campaign

New LRES Grants Awarded from Dec. 2013 - Nov. 2014

These funds fuel our research and teaching mission - to discover new knowledge, to engage and train students using laboratory and field studies across local to global scales, and to enrich the lives of Montanans. Please take a minute to congratulate our faculty and staff on their meaningful work and impressive accomplishments.

Agency & (Co)PI	*Title*
Montana Grants	
Montana Department of Agriculture	
Mangold	Montana Noxious Weeds Education Campaign
Mangold	Predicting Plant Community Response to Weed Control: When is Revegetation Necessary?
Montana Department of Environmental Quality	
Ewing, Hartshorn	Story Mill Site Wetland Restoration Monitoring
Sigler, Kaylor	2014-2015 Volunteer Water Quality Monitoring Support
Montana Fertilizer Tax Fund	
Chen, Engel	Investigating Crop Nitrogen Uptake as Affected by Cropping Systems and Management Strategies
Engel, Miller, Jones, Chen, Wichman	Fertilizer Management Strategies for Enhanced N Recovery and Reducing N Losses in No-till Wheat
Ewing, Jones, Brookshire	Research Analytical Chemist, Environmental Analytical Laboratory
Jones, Miller	Determining the Long-Term Effects of Diversified No-Till Cropping Systems on Nutrient Uptake and Availability
Maxwell, Jones, Jencso, Barroso, et al.	Impact of Precipitation and Temperature on Nitrogen Fertlizer Management
Miller, Jones, Bekkerman, et al.	Long-Term N Management in Alternative Crop Rotations
Walsh, Miller	Evaluation of Urea-Potassium Chloride Blend and Residue Management in Spring Wheat
Walsh, Miller	Plant Population and N Application Time for Improved Spring Wheat Production
Walsh, Miller	Potassium Management for Improved Dryland Spring Wheat Grain Yield and Quality
Walsh, Miller	Unmanned Aerial Systems for Precision Crop Sensing
Weaver	Influence of Nitrogren on Wheat Stem Sawfly Parasitoid Numbers in Hollow and Solid Stem Spring Wheat
Montana Noxious Weed Trust Fund	
Lehnoff, Mangold, Menalled, Rew, Seipel	Understanding and Mitigating the Impact of Cheatgrass Under a Changing Climate
Littlefield	Biological Control of Common Tansy and Ox-Eye Daisy
Littlefield	Biological Control of Invasive Hawkweeds
Littlefield	Biological Control of Russian Knapweed
Littlefield	Biological Control of Whitetop
Mangold	Montana's Noxious Weeds Mobile App
Maxwell	Patterns and Mechanisms of Cheatgrass Invasion in the Northern Great Plains
Weaver	Biocontrol of Invasive Toadflax Using Stem Inhabiting Weevils
Montana Wheat & Barley Committee	
Jones, Miller, Zabinski	Evaluations of Winter and Spring Wheat Performance and Associated Soil Health Measurements Following Cover Crop Cocktails
Maxwell, Littlefield, Menalled	Ecological Management of Field Bindweed (*Convolvulus arvensis*) in Cereal Systems
Menalled, Davis	Control of Glyphosate Resistant in Fallow with Soil Active Herbicides
Menalled, Mangold	Integrated Management of *Bromus tectorum* in Winter Wheat: Incorporating a Soil-Borne Fungal Pathogen
Miller	Legacy Effects of Long-Term Diversified Cropping Systems
Stoy, Ewing, Miller	Are There Any Hydrologic Benefits to Fallow? Quantifying Water Use in Montana Wheat Fields and Designing Strategies for Avoiding Fallow when Unnecessary
Weaver	Implementation of Wheat Stem Sawfly IPM
Weaver	Parasitoids of the Wheat Stem Sawfly: Augmentation, Validation and Education

Federal Grants

USDA Agriculture and Food Research Initiative

Littlefield	The Role of Hybridization in Biological Control of Weeds

USDA Animal and Plant Health Inspection Service

Littlefield	Biological Control Agents of Russian Knapweed: Conservation, Redistribution and Monitoring of Agents
Littlefield	Biological Control of Orange Hawkweed
Weaver	Collection of the Stem-Mining Weevil, *Mecinus janthinus* Germar for Redistribution on Yellow Toadflax Species

USDA Bureau of Land Management

Mangold, Menalled	Biological Control and Integrated Managemetn of Invasive Annual Grasses
Mangold	Montana Noxious Weeds Education Campaign
Weaver	Biological Weed Research in Montana

US Department of Energy

Stoy	Bridging Land-Surface Fluxes and Aerosol Concentrations to Triggering Convective Rainfall

US Fish and Wildlife Service

Goodwin	Invasive Species Management Contributions to Greater Sage-Grouse Conservation

US Geological Survey

Stoy	Improving Accessibility to Satellite Soil Moisture Measurements: Linking SMOS Data Retrievals to Ground Measurements in Montana

National Park Service

Sigler, Kaylor	Water Resource Monitoring: Greater Yellowstone Network Parks

National Science Foundation

Hartshorn, Stoy	UTRAC: Using Technology to Research After Class
McDermott	A Cellular Systems Analysis of Microbe-Arsenic Interactions
McDermott	Institute on Ecosystems - INSTEP Year 3
Poole	Institute on Ecosystems - INSTEP Year 3
Priscu, Michaud	Microbial Carbon Cycling Beneath the West Antractic Ice Sheet
Priscu	Whillans Ice Stream Subglacial Access Research Drilling: Integrative Study of Marine Ice Sheet Stability and Subglacial Life Habitats in West Antarctica

Private, University, Regional, and Other State Grants

America View Inc.

Deagan, Sterling	Proposal to Provide Program Director Services to AmericaView
Lawrence	StateView Program Development and Operations for the State of Montana

Confederated Tribes of the Umatilla Indian Reservation

Poole	Detecting Hyporheic Influences on Whole Stream Temperature Pattern

Dow AgroSciences LLC

Peterson	Assessing Efficacy, Exposure, and Risk for Pesticide Drift Reduction Technologies

Koch Agronomic Services

Engel	Effect of Agrotain on NH_3 Volatilization, N Recovery, Yield, and Protein Response of Dryland Winter Wheat to Urea Applied during Cold Weather Months

Montana Weed Control Association

Mangold	Noxious Weed Listing Research

Northern Pulse Growers Association

Davis, Menalled	Evaluation of Burndown Efficacy and Preemergence Grass on Broadleaf Weed Control in Pulse Crops
Miller	Exploring the N Fixation Potential of Small-Seeded Fababean

Organic Advisory and Educational Services

Menalled, Mangold, Orloff	A Meta-Analysis of Previous Canada thistle (*Cirsium arvense*) Control and Management Studies
Menalled, Mangold, Orloff	A Meta-Analysis of Previous Field Bindweed (*Convolvulus arvensis*) Control and Management Studies

Pacific Northwest National Labs

Inskeep	PNNL Joint Appointee (Senior Research Scientist)

Enrollment in Online Master's Program Sees Rapid Growth

"More than 50 students are pursuing a master's degree in environmental sciences through an online program at Montana State University.

The fact that the program is only two years old and its enrollment is growing so quickly shows that the program is meeting a need, said program founder and director **Bob Peterson**, LRES Professor of Entomology. He thought it might take four years to reach that milestone.

Marley Vaughn of Jackson, WY , was among the online program's first three graduates in Spring 2014

The online program offers 15 MSU courses and the opportunity to participate in independent study and internships. Thirteen faculty members teach [these] online courses. Students spend time reading and participating in online discussions. They [write] a professional paper based on research or original data. Depending on their course load, work ethic, and what's going on in the rest of their lives, they [can] graduate in two years.

Carla Rickert, who is from the Sioux Falls, S.D. area and lives in Florida for part of the year, is one of the three students who have graduated so far from the master's degree program. 'I have dreamed about getting my graduate degree for many years,' Rickert said. 'The online LRES program gave me the opportunity to accomplish this dream.'

Current student Shae Allen said he learned about MSU's program while searching for a master's program that emphazied land management practices and could be completed online. He is serving in the military and has lived in Japan for the past two years. One component he found particularly attractive was that [the program] offered students the opportunity to attend five- to 14-day courses on campus during the summer. He plans to use his master's degree education to pursue a career in an environmental or land management field, preferably in the National Park Service."

Excerpts from MSU News article dated 9-9-14 by Evelyn Boswell

New LRES Graduate Students

Spring 2014

Marianne Alford
M.S. LRES Online
Baton Rouge, LA

Abdullah Alowaifeer
Ph.D. ECES
Advisor: McDermott

Autumn Coleman
M.S. LRES
Helena, MT

Shannon Crosser
M.S. LRES Online
Costa Mesa, CA

Kelly Dalton
M.S. LRES Online
Irvine, CA

Sara Drane
M.S. LRES Online
Tuscon, AZ

Benjamin Fournier
M.S. LRES Online
Fredericksburg, VA

Rebecca Hosley
M.S. LRES Online
Colorado Springs, CO

Megan Housman
M.S. LRES
Advisor: Zabinski

Amanda MacPherson
M.S LRES Online
York, PA

Gant Massey
M.S. LRES Online
Hamilton, MT

Rory McPherson
M.S. LRES Online
Point Mugu, CA

Robert Mediak
M.S. LRES Online
Stevensville, MT

Carlos Romero
M.S. LRES
Advisors: Engel & Chen

Jennifer Schmitz
M.S. LRES Online
Seattle, WA

Aaron Scott-Klingborg
M.S. LRES
Advisor: Brookshire

Angela Tang Che Ing
Ph.D. ECES
Advisor: Stoy

ECES: Ecology & Environmental Studies
LAND: Land Rehabilitation
LRES: Land Resources & Environmental Sciences

Powell Attends Distance Education Conference

I recently had the opportunity to attend the 30th Annual Conference on Distance Teaching and Learning hosted by the University of Wisconsin, Madison. Not only was it an incredible conference venue on the shores of Lake Monona right next to the state capitol, but the conference provided me with an excellent opportunity to compare and contrast our unique online MS program in LRES with other online programs around the country and to learn about best practices in distance education. The biggest take-home message for me was that our new and growing program is on the right track. In this era of Massive Open Online Courses (MOOCs), our program is striving for something quite the opposite – the "localization" of online education. Our students are attracted to MSU and LRES because we offer small, interactive, locally-tailored classes. This is a unique strength of our program and helps set us apart in the ever-changing, and rapidly expanding world of distance education.

A view of the WI Capitol Building

Photo: Scott Powell

Scott Powell

Research in Pictures

Prof. Bruce Maxwell and graduate student Kim Taylor on a research project in Barlioche, Argentina

Fall 2014

Andrew Bobst
Ph.D. ECES
Advisor: Payn

Keenan Brame
Ph.D. ECES
Advisors: McDermott & Camper

Rebecca Hollender
M.S. LRES Online
Maplewood, NJ

Jeri Irby
M.S. LRES Online
Purcell, OK

Robert Kellin
M.S. LRES Online
North Oaks, MN

Emiliy Lanku
M.S. LRES Online
Athens, GA

Shelley Mills
M.S. LRES Online
Glasgow, MT

Elizabeth Montgomery
M.S. LRES Online
Los Angeles, CA

Bradley Newman
M.S. LRES Online
Soddy Daisy, TN

Jeffrey Patriarche
M.S. LRES
Advisor: Priscu

Emily Pierson
M.S. LAND
Advisor: Rew

Zev Reuter
M.S. LRES Online
Cold Spring, NY

Rochelle Rodman
M.S. LRES Online
Los Angeles, CA

Amanda Rothermal
M.S. LRES Online
Colorado Springs, CO

Michael Sarmento
M.S. LRES Online
Lakeswood, CO

Nicholas Sovner
M.S. LRES Online
Helena, MT

Meryl Storb
Ph.D. ECES
Advisor: Payn

Erica Sturn
M.S LRES Online
Billings, MT

Dorjderem Sukhragchaa
M.S. LAND
Advisor: Zabinski

Erin Tantillo
M.S. LRES Online
Palatine, IL

Hannah Thatcher
M.S. LRES Online
Billings, MT

Jolene Warnke-Roszel
M.S. LRES Online
Helena, MT

ECES: Ecology & Environmental Studies
LAND: Land Rehabilitation
LRES: Land Resources & Environmental Sciences

GSO Report

We thought this would be a good opportunity to give an update on the LRES Graduate Student Organization (GSO). First off, new members of LRES might appreciate knowing what we as the GSO do. The role of the GSO is to facilitate networking opportunities for LRES grad students by organizing student activities and providing an interface with faculty. The main event that the GSO organizes is the annual LRES Research Colloquium which gives students an opportunity to present on their projects. Other important activities include social events and volunteering and community service involvement.

As we reflected on our new roles as co-chairs we thought about what it means to be in the LRES community and how the GSO can promote that sense of community. In an article about sense of community, McMillan and Chavis described a person's perception of community as being composed of four main elements. *Membership* is what you feel when you "belong" because you relate with your peers. *Influence* makes you feel like you matter because you can make a difference within the group that you belong. *Fulfillment of needs* is the reward you get for your membership. And *having a shared emotional connection* comes from having a common goal and going through similar experiences to reach it.

A fundamental aspect of maintaining and promoting the four elements of community within the graduate students of LRES is member participation. So we'll look forward to seeing you at GSO events and please let us know if you have ideas on how the GSO can better promote community among the LRES grad students. Maybe most important is how can the GSO contribute towards our common goal of being successful graduate students? Feel free to contact us at **lresgso@gmail.com**.

The next GSO event will be a happy hour in mid-November at a nearby location. Look for an email reminder from Stephen Johnson through the LRES front desk. Also, planning has already started for the LRES Research Colloquium which will be held in a SUB ballroom in April. Start thinking now about presentation ideas for the Colloquium. The Colloquium provides a great opportunity for people to get some exposure within LRES, practice presenting in an informal setting, and get the word out on your project. Let your fellow grad students know what it is that you have been pouring your heart and soul into!

Collin Preftakes & Chris Brown

14/15 GSO Officers

- **Collin Preftakes**, Co-chair
- **Chris Brown**, Co-chair
- **Nar Ranabhat**, Curriculum Committee Liaison
- **Stephen Johnson**, Faculty/Staff Social Committee Leader
- **Subodh Adhikari**, Mentoring Committee Liaison

Research in Pictures

Tim Seipel, Research Associate, and Christian Larson, graduate student, set up experiments in Jack Creek Preserve

Noelani Boise, undergraduate, and Christian Larson, graduate student, sample vegetation

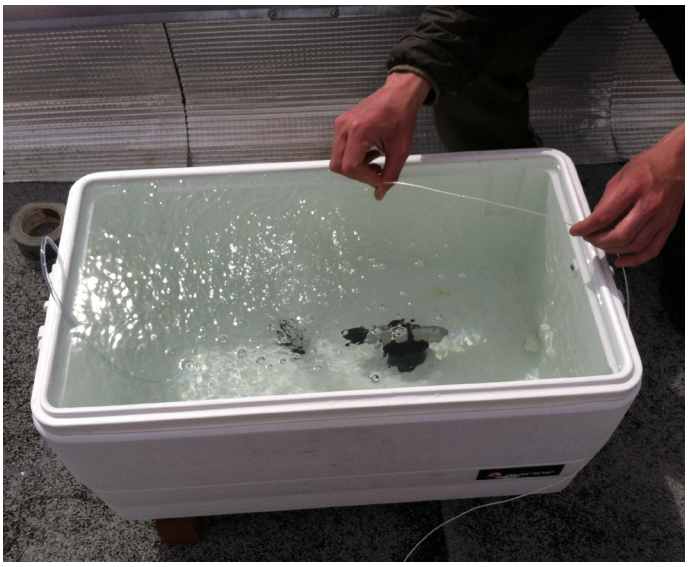
Photo: Chance Noffsinger

"Cooler Cooler?"

Report from the Fluvial Landscape Lab

How many of you outdoor-types have coveted one of those space-age, ultra-rugged, ultra-insulated coolers on the market today? With an asking price of $400 or so, the coolers promise to keep contents colder, for longer! Recently, the Montana State Fluvial Landscape Lab has been putting a couple of coolers through a battery of rigorous tests. The tests are part of an ongoing research project studying how the shape of a river channel can influence river water temperature.

Amazingly, it's true. Our research is helping to reveal how river-bends, side channels, and complex streambed topography can all encourage river water to enter, flow through, and re-emerge from streambed gravels, ultimately changing temperature patterns in rivers.



So what do coolers have to do with river temperature? Well, lab researchers are building a computer model to simulate stream temperature. With the model, we can simulate different rates and magnitudes of water exchange between the river channel and underlying gravel to understand influences on river temperature. But there's a catch. A river exchanges heat with the atmosphere too! Our model has to account for that. So we started simulating water temperature in coolers.

"Say what?"

The (ahem) "cool" thing about a cooler is that almost no heat moves through the sides or bottom of a cooler, so if we fill it with water and leave the lid off, we have an simple experimental system where, unlike a natural pond or stream, observed changes in water temperature in the cooler are driven only by heat exchange with the atmosphere.

Our model uses measurements of air temperature, wind speed, relative humidity, cloud cover, and sun angle – collected by a set of weather sensors located next to our experimental coolers – to predict daily variation in water temperature in the coolers. We have other sensors recording water temperature in the coolers to see if the temperatures predicted by the computer model are correct. When our model successfully predicts water temperature in the coolers, we know it is simulating heat exchange between the atmosphere and water correctly. Then, we can combine this atmospheric model with a model that simulates downstream heat movement (with river flow), and a model that simulates heat movement into and out of the streambed. This way, we get a complete picture of the heat exchange processes controlling temperature dynamics in streams.

Sam Carlson, graduate student, checks a cooler on the roof of Cobleigh Hall

So what's that you say? The coolers? Oh right...

If you need a really rugged, portable storage box, the $400 coolers might be worth it. But as far as our tests show, a $60 "extreme" cooler is just about as effective at keeping things cold. Go figure.

Geoffrey Poole directs the Montana State Fluvial Landscape Lab, where researchers study how water movement across floodplains, within stream corridors, and throughout river networks influences the ecology of running waters.

LRES 2014-2015 Scholarship Recipients

Aasheim Family Leadership Scholarship
Nathaniel Powell-Palm

Battle Ridge Ranch Scholarship
Hailey Gelzer
Kaylee Schmitz

Bill & Anita Jones Agricultural Scholarship
Talinna Appling
Katie Noland

Thomas D. Campbell Memorial Scholarship
Jacklynn Lathrop
Dionne Zoanni

Donaldson Family Memorial Scholarship
Tucker Colvin

Clyde & Helen Erskine Excellence in Ag Scholarship
Nicholas Uehling

MSU Farmhouse Alumni Scholarship
Sarah Spear

First Security Bank Scholarship
Talinna Appling

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Erik Anderson

Montana Winter Fair Ag Scholarship
Jacklynn Lathrop
Sarah Spear

Frank F. Munshower Scholarship in Land Rehabilitation
Andrew John

Newman/Abbott Nutrition Undergraduate Scholarship
Kendall Franks

Newman Family & Friends Scholarship
Subodh Adhikari
Krista Ehlert

Dr. Arthur H. Post & Margaret Post Scholarship
Sarah Spear

Rice Family Scholarship
Jeana Ratcliff

Wagner Heritage Scholarship
Dionne Zoanni

Opportunities to Support LRES

A gift to the department is a great way to support student and faculty endeavors. Donations can be earmarked for student scholarships or internships, graduate fellowships, undergraduate and graduate student programs, endowed professorships, and more. For information about making a donation to the Department, please contact Kevin Brown, MSU Alumni Foundation, College of Agriculture, Director of Development (406-994-4851 or kbrown@montana.edu).

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