

# Newsletter LRES

College of Agriculture Spring 2012

## Congratulations Graduates

Our department has had a banner year with so many milestones! To name a few, we had our first ever external review by six nationally-renown scientists and educators who found us “to have an exceptional and dedicated research and teaching team that is nationally and internationally recognized.” We celebrated with Cliff Montagne as he retired after 35 years at MSU with an extraordinary career which immersed students in the exploration of soil science, natural resource issues, and personal decision making. This past academic year, 9 B.S., 12 M.S., and 10 Ph.D. students have all earned their degrees! These impressive accomplishments are truly something to celebrate.

Graduates – I extend my heartfelt congratulations to you as you seize your next opportunities. Do stay in touch so we can learn about your wonderful accomplishments.

~Tracy Sterling, Professor & Department Head

*“Go confidently in the direction of your dreams. Live the life you have imagined.”*

— Henry David Thoreau

## LRES Recognition

### Awards for Excellence 2012



Kelly Gorham/MSU



LRES celebrated the accomplishments of one graduating senior, Megan Podolinsky (Environmental Biology & Spanish), at the Thirtieth Annual Awards for Excellence. To be eligible for the Award, students must have a 3.5 grade point average, have an exemplary record of campus and community involvement, and a substantive history of service. The award-winning students each selected a mentor who was honored with them at the event. Podolinsky selected Professor Geoffrey Poole from LRES. Additionally, Megan received the Torlief Aasheim Community Involvement Award. Read the full article [here](#).

## NACTA Award winners for College of Agriculture



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 to inspire all of us to achieve the highest levels of excellence. This year’s COA awardees are our own Rick Lawrence and Aaron Rains. Rick Lawrence received the Teaching Award of Merit in recognition of meritorious efforts in College Teaching; and Aaron Rains received the Graduate Student Teaching Award of Merit for recognition of meritorious efforts in College Teaching. The department is deeply grateful to your commitments to student success and instructional excellence. Congratulations!

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# LRES Recognition (continued)



**Bruce D. Maxwell's** research on the over-reliance on herbicides for weed control on U.S. farms and how it has created a dramatic increase in the number of genetically-resistant weeds, has been published in an article on integrated weed management and recognized in [ScienceDaily](#) and in [Wired](#) magazine.



**Jack Brookshire** was published in *Nature Geoscience*. His research focused on how many tropical forests are extremely rich in nitrogen even when there are no farms or industries nearby. [Sustained losses of bioavailable nitrogen from montane tropical forests](#)



**Scott Powell** was invited to present his research at the Association of American Geographers Annual Meeting in New York City on February 25, 2012. The title of his talk was "Assessment of forest disturbance and biomass flux across the conterminous U.S."



**Susan Kelly** coordinated the Climate Change Summit in Hardin on March 3rd, as part of the Crow Education Partnership Project that was organized in collaboration with the Hardin School District. MSU graduate students, with the largest representation from LRES, helped out. [Student Climate Change Summit](#)



**Christine Foreman and Susan Kelly** organized Polar Science activities on behalf of the NSF-Polar Program Office at the National Science Teachers Association Meetings reaching over 16,000 teachers.



**John Priscu's** research was highlighted in:

- Astrobiology magazine: [Breaking Through the Ice at Lake Vostok](#)
- Scientific American: [Russian Scientists to be First to Reach Ice-Buried Antarctic Lake.](#)
- Scientific American: [Melting Glaciers Liberate Ancient Microbes](#)
- Priscu's lab group was recently featured on [Discovery Channel Canada: Ice Microbes](#) (scroll ahead to 6:40)
- American Society for Microbiology journal MICROBE: [Microbial Habitability of Icy Worlds](#)



**David Ward** appeared on Wednesday, April 4, on "Hunting the Elements," a two-hour PBS program produced for NOVA. Read the story [here](#).



The department bids a fond farewell to **Brian McGlynn**, Associate Professor, who will be joining Duke University in a few months. We thank him profusely for his impressive contributions over the past 10 years to forward our research and teaching missions. He will be missed.

## Promotion and Tenure



Congratulations to **Clain Jones** for earning tenure and promotion to Associate Professor. His accomplishments were recognized at President Cruzado's Celebratory Dinner on May 1st. Please take a moment to congratulate him! Also, join us on **May 11 at 5 pm at Colombo's** where we will continue our tradition of celebrating these milestones together.

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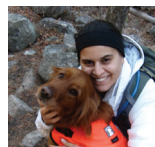
*The following awards are highly competitive, reflecting our students' abilities and accomplishments, as well as the quality of LRES programs.*



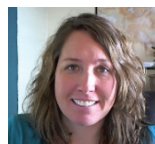
**Tim Covino** earned a MS and a PhD from LRES with Brian McGlynn as his advisor and was awarded a 2 year NSF Post Doctoral Fellowship. He will work with faculty at Duke, while maintaining close ties with MSU, including John Dore and Lucy Marshall.



**Kendra Kaiser** earned a BS in LRES last spring and has been working with the Watershed Hydrology Lab. She will study at Duke with her newly awarded NSF Graduate Research PhD Fellowship and continue to work collaboratively with John Dore and Lucy Marshall. LRES and the College of Agriculture sponsored Kendra to present her research at the European Geoscience General Assembly in Spring 2011.



**Christine Romano**, a postdoctoral researcher (PhD Caltech) with Timothy McDermott, will use her three-year NSF postdoctoral fellowship in biology to join the oceanography group at Oregon Health and Science University.



**Leslie Jones** earned her MS from LRES, co-advised by Lucy Marshall and Brian McGlynn. She just received a 3 year NSF Graduate Research Fellowship Program (GRFP) PhD award. She will bring it to the University of Montana, but will be co-advised by Lucy Marshall.

## LRES Recognition (continued)



**Lisa H. Lone Fight's** article *Effective practices for creating transformative informal science education programs grounded in Native ways of knowing* was published. Read the article [here](#).



**Jerome J. Schleier III** won the 2012 Hollandsworth Prize for Best Student Paper Presentation at the annual meeting of the American Mosquito Control Association in Austin, Texas. This is the premier award given to graduate students by AMCA. His presentation was titled *Model Development for Predicting Environmental Concentrations after Applications of Ultra-Low-Volume Insecticides for Adult Mosquito Management*.



**Justin O'Dea**, a recent MS LRES Graduate from Perry Miller's Cropping Systems Lab, accepted a position with Cornell University's Cooperative Extension program in New York State. Justin will

be working with Ulster County, NY's agriculture Extension team as a vegetable production specialist for the mid-Hudson Valley.



**Ron Lodgepole**, a LRES graduate student, member of the Chippewa Cree tribe and co-president of MSU American Indian Council, organized and ran the largest powwow in the region this April here at MSU. [Read the article from the Bozeman Daily Chronicle](#).



**Krista Ehlert, M.S.** student co-advised by Rick Engel and Jane Mangold, won first place in the student paper oral presentation contest in the Range & Agriculture category at the Western Society of Weed Science 65th annual meeting in Reno, NV, March 12-15. Her paper was titled "*Using soil bioassays to assess imazapic degradation to improve cheatgrass management.*"

## Montana Institute on Ecosystems Graduate Fellows

**Montana IoE Graduate Fellows are outstanding graduate students who 1) work in interdisciplinary areas related to the IoE's mission and 2) were competitively selected to receive direct IoE support.**



**Melissa Bridges:** Ecology & Environmental Sciences PhD, *Modeling Invasive Plant Species Distribution and Integrating into a Management Prioritization*. Advisors: Bruce Maxwell and Lisa Rew

**Tim Covino:** Ecology & Environmental Sciences PhD, *Disentangling the physical and biological controls on stream network nutrient retention*. Advisor: Brian McGlynn

**Leslie Jones:** Pursuing a PhD at the University of Montana. *Developing High-Resolution Models and Web-Based Tools to Assess Potential Effects of Climate Change on Aquatic Ecosystems in the Crown of the Continent*. Co-Advisor: Lucy Marshall



**Ilai Keren:** Ecology & Environmental Sciences PhD, Mathematical Sciences. *Joint Management of Wheat Stem Sawfly, Fusarium Crown Rot, and Weeds: Assessing the Ecological Basis of a Total Systems Approach to Pest Management Strategies*. Advisor: Fabian D. Menalled

**James Meadow:** Ecology & Environmental Sciences PhD, *Arbuscular mycorrhizal fungal community ecology and*



*diatomaceous biological soil crusts in geothermal soil environments of Yellowstone National Parks*. Advisor: Catherine Zabinski



**Fredric Pollnac:** Ecology & Environmental Sciences, *Non-native plants in mountain systems: A case study of Dalmatian toadflax*. Advisor: Lisa Rew

**Jerome Schleier III:** Ecology & Environmental Sciences Ph.D., *Development of an Environmental Fate Model for Risk Assessment of Ultra-Low-Volume Insecticides*. Advisor: Bob Peterson



**Tanya Skurski:** Ecology & Environmental Sciences PhD, *Quantifying non-native plant impacts: Centaurea stoebe (spotted knapweed) and Bromus tectorum (downy brome) in sagebrush-gaslands of the Greater Yellowstone Ecosystem*. Advisors: Bruce Maxwell and Lisa Rew



**Tyler Smith:** Ecology & Environmental Sciences PhD, *Conceptual Hydrologic Modeling: Insights into Bayesian Analysis, Model Development, and Predictions in Ungauged Basins*. Advisor: Lucy Marshall

## An Evening with the Native American Flute



On Wednesday, April 11 from 7:30 to 9:00 p.m. in the Community Room of the Bozeman Public Library, the Northern Winds Flute Circle introduced the Native American flute's construction and history; and local artists performed traditional, contemporary, and original music. 50 attendees were present. Rick Lawrence, professor in the LRES department, is part of the Northern Winds Flute Circle group.

Flutes are part of ancient Native American tradition. Flutes roughly 1000 years old have been found in caves in the Southwest. They were used for ceremonies, healing, and "courting". The Native American flute is unique in being a dual chamber flute, with the chambers bridged by a fetish (wood or hoof block), which creates its distinctive haunting sound.

## GSO Activity: 2<sup>nd</sup> annual LRES Research Colloquium

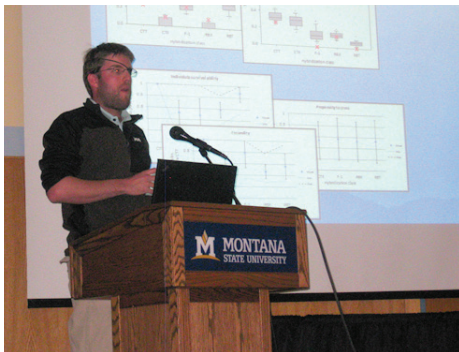
The second annual LRES Research Colloquium took place on April 12th, and was a roaring success, thanks to the hard work put forth by the LRES Graduate Student Organization (GSO).

With four oral paper presentations and 11 posters, the LRES Research Colloquium showcased both graduate and undergraduate research. Oral paper presenters were: Sam Carlson, Patrick Della Croce, Aiden Johnson, and Tristy Vick. Poster presenters were: Byron Amerson, Krista Ehlert, Paramjit Gill, Carmel Johnston, Kimberly Taylor, Karin Neff, Colin Preftakes, Aaron Rains, Paddy Stoy, Chris Welch, and Laura Whitmore.

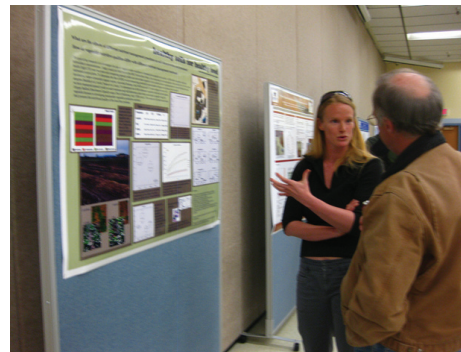
Nearly 70 faculty, students, and staff attended this year's Colloquium, adding to its success! If you see any of the GSO members or student presenters, please congratulate them on a job well done! Additional funding this year was obtained through NSF-EPSCoR, which combined with funding provided by the LRES Department, allowed this year's event to set a high precedence for the 2013 Colloquium. Thank you all for attending, and don't forget to keep in mind the LRES Research Colloquium this time next year!!

### LRES Graduate Student Organization

The LRES Graduate Student Organization (GSO) is in its third year. The 2011-2012 GSO Committee (Co-chair Krista Ehlert, Carmel Johnston, mentoring committee representative Evelyn Konigsberg, social representative Alex Michaud, co-chair Kelly Mildenerger, Christine Miller, faculty liaison representative Paddy Stoy, and curriculum representative Jason Wood) worked with the the department curriculum committee to collect student feedback on the structure of the LRES 594 Seminar and the structure of the Ph.D and M.S. programs within LRES, and worked to facilitate departmental interaction via socials, which are now being held monthly at Colombo's.



PhD candidate Patrick Della Croce, presenting his talk entitled "Trout hybridization in the Lamar River drainage: trends and potential mechanisms."



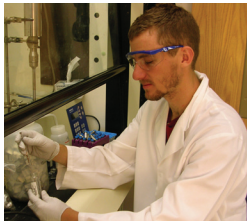
PhD candidate Karin Neff presenting her poster entitled "Healthy soils for healthy food: soil organic matter effects on spinach crops."

### GSO welcomes new officers for 2012-2013

<b>Co-chairs</b>	<b>Curriculum Representative</b>
Aiden Johnson	Jason Wood
Carmel Johnston	
Kim Taylor	
<b>Social Representative</b>	<b>Faculty Liaison Representative</b>
Christine Miller	TBA

# LRES Outstanding Senior Awards

## Tom Bogen



Tom, a Bozeman native, will graduate with honors this semester with a double major, one in Spanish and one in Environmental Sciences with a concentration in Soil and Water Science.

While pursuing his degree, he pursued his musical interests through participating in the MSU Percussion Ensemble, Chorale, A Cappella Ensemble, and Orchestra. He has been on the Dean's List several times and was a National Honors Society Member. He had the opportunity as an Undergraduate Scholar to work with Rich Macur to develop methods for the analysis of algal lipids, work which will be published this summer in *Journal of Applied Phycology*. In addition to these scholarly accomplishments, Tom was also active in the Spanish Club, served as a Residence Life Assistant, was a CAP Mentor, and helped with the Danforth Park Renovation and the Relay for Life. To add to this impressive list, Tom spent a semester abroad through the International Student Exchange Program at Pontificia Universidad Católica in Argentina, where he immersed himself in Spanish classes, including a class in Cinema. The department wishes him the best for his continued success.

## Jessica Smith

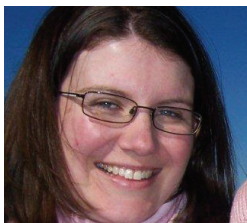


Jessica graduates this semester with honors for her B.S. of Environmental Science degree with a concentration in Environmental Biology, and a minor in English Writing. A Broadus MT native, Jessica has clearly demonstrated that she

represents the ideals of our department and its mission. She has been on the Dean's list many of her semesters here, and received the Montana's Governor's Merit Scholarship and the Arthur Post Scholarship. She has been involved in various activities including MSU Range Club, College Young Farmers and Ranchers, and the Montana Cattlewomen's Club, as well as the Gallatin Valley Food Drive. She has also earned an Honors' degree and co-taught one of the Honors entry courses, CLS 201, "Texts and Critics". She is a Sigma Alpha Sorority PanHellenic Delegate, and their scholarship chair and co-founder. Jessica says about our program: "All the teachers I've had have been wonderful. They made sure to motivate me to learn and succeed by teaching me great information and skills". She plans to pursue a M.S. degree in Restoration or Ecology after spending some time on her family's ranch assisting with its management. We wish her the best for her continued success.

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## Faculty Spotlight: Lucy Marshall



Dr. Lucy Marshall is an assistant professor of watershed analysis with an active research and teaching program in hydrologic modeling, environmental data analysis, and model optimization and uncertainty analysis. Lucy teaches ENSC

445 Watershed Analysis each spring semester, and LRES 546 Quantitative Methods for Environmental Modelers each alternate spring semester. Watershed Analysis emphasizes applied hydrologic data analysis and hydrologic modeling for applications such as streamflow forecasting, snowmelt estimation, and hydrologic design. Her Quantitative Methods class looks at different applied statistical and numerical methods used in analyzing environmental systems, including time series analysis, spatial statistics and uncertainty assessment.

Lucy received a Master's degree in Engineering Science and a PhD in Civil and Environmental Engineering from the University of New South Wales. Hailing from Sydney, Australia, she joined LRES in 2006 and initiated the Watershed Analysis Laboratory. The lab consists of multiple graduate students, undergradu-

ate researchers, and technicians working on research projects related to hydrologic model development, statistical models of climatic variables, predictions in ungauged basins, hydrologic data management, and Bayesian statistical inference in rainfall-runoff modeling. Three graduate students are graduating from the watershed analysis lab this semester; Leslie Jones (MS), Randy Mullen (PhD) and Tyler Smith (PhD). Leslie is going on to a PhD program looking at stream temperature modeling, Randy is starting a post-doc position with University of Alaska in Fairbanks, and Tyler is starting a faculty position in civil engineering at Clarkson University. The laboratory collaborates institutionally, nationally, and internationally with other researchers to explore multiple types of hydrologic systems and methods for data analysis. Researchers in the lab are currently working with colleagues in Australia to develop multi-model methods for predictions in ungauged basins. This project has involved multiple student exchanges between the University of New South Wales and LRES, with students examining topics such as watershed clustering and classification, Bayesian inference for ephemeral streams, and new hydrologic model development.

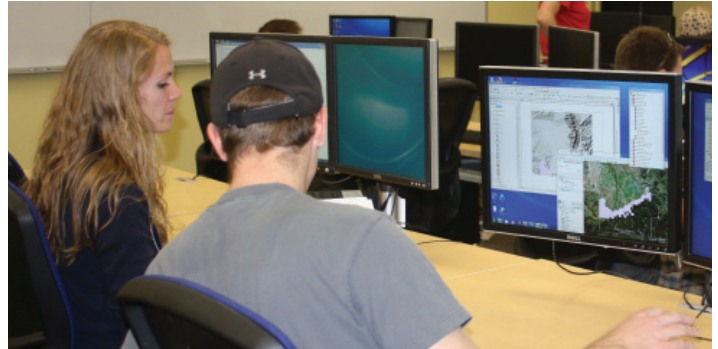
# Space for Spatial Sciences Center

Excerpt from AgExcellence, 2010-2011.

Whether it's mapping beetle-killed trees, feeding data to emergency responders, monitoring geothermal activity in Yellowstone National Park, pinpointing optimal herbicide placement, or monitoring no-till practices for carbon sequestration, more and more of the research done, not only in the College of Agriculture, but university-wide, uses data collected from satellites and planes, and mapped using Geographic Information Science (GIS) and Global Positioning System (GPS) technologies.

That rapid growth has created a steep increase both in research and in the need to teach students how to use GIS, GPS, and remote sensing technologies effectively. Course enrollments for spatial sciences classes at MSU increased by 19 percent in the past five years, with waiting lists for many required courses and lab facilities stretched beyond their intended use.

In 2011, with support from the Provost's Office and the College of Letters and Sciences, the College of Agriculture allocated funds to move the Spatial Sciences Center's offices, classroom, and labs to larger, remodeled spaces in Leon Johnson Hall. The Center is now able to accommodate 25 percent more students in a specifically designed learning environment with lab access to



state of the art equipment.

Instructors Diana Cooksey (LRES), Stuart Challender (Earth Science), and Rick Lawrence (LRES) have been able to increase their class enrollments and the Center has added two new courses to the nine already offered.

Geospatial technology is one of the fastest growing job markets in the U.S., said Lawrence, and the new facilities help MSU's Spatial Sciences Center better prepare MSU students to work with the spatial data that's integral to science today.

"Location has become key to the information age, and that's what we do."

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## Leon Johnson Energy Upgrade, Construction Update

By Cristie Tate, Project Manager

The much needed upgrade of the heating and cooling systems in Leon Johnson is well underway.

Major project milestones that have already been completed include:

- Removal of the existing cooling system from the basement.
- Demolition of old snowmelt system that services the pit. A new system will be up and running by next winter.
- Installation of new mechanical room control wiring for all floors.
- Installation of new heat pumps in the basement (these pumps will also provide cooling).
- Preparatory work to install the exhaust fans and air handling units on the roof.

### What comes next?

■ May 8th a crane will set the new exhaust fans and air handling units on the roof of Leon Johnson. These new exhaust fans will replace the noisy decentralized fans that currently service the fume hoods in Leon Johnson and will provide safer working conditions. The new exhaust system was designed for fume hoods to remain in use with the existing

exhaust system, until they are hooked up to the new fans on the roof.

■ New fume hood controls will be installed in a horizontal piece of the exhaust pipe. In locations where this pipe is transite (asbestos containing material), an abatement will be required. This work will be coordinated with individual laboratories on a floor by floor basis.

■ Safety and Risk Management is going to assist this project by providing portable chemical storage units. For the contractor's safety, all chemicals stored in fume hoods will be removed while being hooked up to the new exhaust system.

■ New fan coils will be installed in all offices and laboratories, which will dramatically improve the temperature control and comfort throughout the building.

■ The new cooling system is scheduled to be running by June 1st, with the heating system shutdown on May 14th.

The second and sixth floors are the first on the schedule, with the work starting in May. I will be coordinating the schedule with all building occupants as the project progresses. As always, please call Cristie Tate at 209-0154 or 994-7493 or [CristieTate@montana.edu](mailto:CristieTate@montana.edu) with any questions or concerns.

## LRES on Montana AgLive



A regular call-in information program dealing with agricultural and gardening issues in Montana. This program invites experts onto the panel to discuss everything from pesticide use, and large-scale agricultural techniques to backyard gardening questions and even which mushroom to pick in the woods.

Here is a list of recent contributors from LRES:

**Nitrate contamination in water supplies:** Stephanie Ewing, Land Resources and Environmental Sciences, will examine nitrate contamination in the Judith Basin. *To be aired: June 3, 2012.*

**Stream Habitat Restoration:** MSU's Land Resources and Environmental Science professor Geoff Poole will examine

stream habitat restoration from the fish's eye view and how it affects agriculture. *First Aired: Sunday, April 29, 2012.*

**Noxious Weed Research:** Noxious weeds are always a topic of concern to Montanans. This week Jane Mangold will join us to bring us up-to-date on MSU's current research on the topic. *First Aired: May 5, 2011.*

**Cash Crops for Montana:** MSU Cropping Systems Specialist, Perry Miller, will look at profitable cash crops for Montana. *First Aired: March 27, 2011.*

Watch already aired episodes at [www.montanapbs.org/MontanaAgLive/AllEpisodes/](http://www.montanapbs.org/MontanaAgLive/AllEpisodes/)

Other contributors from LRES in the past are: Adam Sigler, Clain Jones, Bruce Maxwell, Fabian Menalled, and Tracy Sterling.

## Crow Education Partnership Field trip



On April 12, a group of 100 4th graders from Hardin Intermediate School in Hardin, Montana traveled to Montana State University for a "Science is Cool" field trip. Students visited several departments across campus, including the Chemistry, Earth Sciences, Computer Sciences, LRES, and Engineering. The event was organized by Susan Kelly, and this year's keynote speaker at lunch was President Cruzado. This is the second annual field trip.

Pictured above, a 4th grader with Christine Foreman tests out how many metal washers a post-it note can hold up.

## Update on WISSARD project

The project will use the hot water drill, pictured at right, (50 gpm, 95°C) to melt a hole (>30 cm diameter, 800 m deep) to the base of the Whillans ice stream in Antarctica. We will be sampling ice, water, and sediments from underneath the ice sheet during the next two austral summers (Nov 2012 – Jan 2013, Nov 2013 – Jan 2014), looking for microbial life in this previously unexplored environment, as well as gaining a better understanding of the factors controlling the ice flow off Antarctica and past ice sheet history. Dr. John Priscu from LRES is one of the three lead investigators in the project, which also includes Dr. Mark Skidmore from Earth Sciences (there are 14 PIs at 9 institutions, total). Tristy Vick and Alex Michaud are grad students on the project.

The test was in Lincoln, NE; the drill is being built under subcontract with the University of Nebraska. As you can see, the equipment for the drill is mounted in 40' shipping containers. We'll send them by cargo vessel to McMurdo Station. There we will mount them on skis, and use tractors to drag them 650 miles to the study site. — Rob Edwards



This photo is from the recent test of the hot water drill to be used on the Whillans Ice Stream Subglacial Access Research Drilling (WISSARD) project. The big red containers in the picture house the drill heater/pump units, and the hose shooting out water and clouds of steam is the business end. In use, it will have a shower head type of assembly attached to the hose. The whole thing is the "drill system," which also includes more containers that house filters and water tanks and control units and reels with longer hoses.

# LRES Graduating Seniors

## Bachelor Degrees

Fall 2011

**Kelsey Griffith**

*Environmental Sciences –  
Soil & Water Sciences*

**Neil Mauws**

*Land Resources Analysis  
and Management*

Spring 2012

**Christopher Lane**

*Environmental Sciences –  
Environmental Biology*

**Matthew Schmidt**

*Environmental Sciences –  
Environmental Biology*

**Jessica Smith**

*Environmental Sciences –  
Environmental Biology*

**Thomas Bogen**

*Environmental Sciences –  
Soil & Water Sciences*

**Rebecca Kurnick**

*Environmental Sciences –  
Soil & Water Sciences*

**Joseph Old Elk**

*Environmental Sciences –  
Soil & Water Sciences*

**Rachel Keiser**

*Sustainable Foods & Bioenergy  
Systems – Agroecology*

## Graduate degrees

### Ph.D. Ecology & Environmental Sciences

Spring 2012

**Macdonald Burgess**

**Melissa Bridges**

**Timothy Covino**

**James Meadow**

**Randall Mullen**

**Fredric Pollnac**

**Marie Sabacka**

**Jerome Schleier III**

**Tanya Skurski**

**Tyler Smith**

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

Summer 2011

**Victoria Bunn**

**Ann McCauley**

Fall 2011

**Gabriel Bellante**

**Eva Black**

**Benjamin Dorsey**

**Justin O’Dea**

**Lesley Orloff**

**Matthew Scrafford**

Spring 2012

**Joy Barsotti**

**Tyler Brummer**

**Leslie Jones**

**John Mallard**



## 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: Darin Paine, Director of Development, MSU College of Agriculture, (406) 994-7671.*