

Rosie Wallander  
Fieldword at Fort Ellis

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Department of  
Land Resources & Environmental Sciences

Land Resources and  
Environmental Sciences

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## Congrats Grads and Happy Holidays to All!

Please enjoy perusing this fall's departmental newsletter highlighting some of our many research, teaching, and service pursuits. We currently enroll 184 undergraduate students, 71 M.S. students, and 24 Ph.D. students. We want to congratulate our graduates who have completed their studies this fall. Best wishes to you in your endeavors!

*Tracy Sterling, Professor & Department Head*

## New Faculty

### Mr. Nicholas Fox, Instructor of Geospatial and Environmental Sciences



I grew up appreciating the outdoors on my family's farm in Missouri, 2 miles, as the crow flies, from the Missouri River. It was there I studied my surrounding ecosystem through childhood curiosity. Whether it was chasing my dogs through broken timber or jumping into our pond, I found my interest growing in science. To me, the farm was a treasure trove of skeletons, reptiles, insects and imagination. One adventure led me to a spring on the property where I cracked open a limestone rock and observed various fossil fragments. It was likely at this point that I began to think earnestly about a path in science. Years later that path was solidified when my brother hiked me through

millions of years of geology along House Mountain in Virginia.

If you ask my parents, they will probably tell you that my interest in rocks is nothing new and to my mom's credit I still find pails of rocks that I collected from when I was a youngster. Formally, I began instruction in geology as a junior in high school, learning field methods to characterize soil on the family farm and delving into the geologic time scale. Immediately, I was hooked, applied to my undergrad (Washington and Lee University, Virginia), declared my major on arrival and took 67 credits of geology (I only missed one class the department offered).

*Continued on page 4*





**Amy Trowbridge** was awarded a \$1 million grant to fund her research on tree chemistry in the battle against bark beetles.

## Milestones in Service

**Jeff Littlefield**- 30 yrs

**Rosie Wallander**- 25 yrs

**Dorie Seymour**- 10 yrs

**Shantell Frame-Martin**- 5 yrs

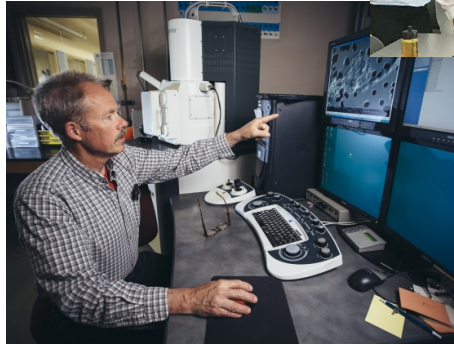


*MSU's College of Agriculture visited the Universidad Veracruzana in Tuxpan, Mexico*



**Perry Miller** and Mary Burrows (PSPP) received a \$3.2 million USDA-NIFA grant to conduct a

four-year project investigating root rot for a better lentil crop.



**Bill Inskip**, a research professor in LRES, was published in Nature Microbiology for his discovery of new Yellowstone National Park microbial lineage.



Professors **Scott Powell** and **Tony Hartshorn** speak at Faculty Symposium on teaching innovation and technology.



**Laissa Cavallini dos Santos** was awarded MSU's Foundation Endowed Fund for MS students in Entomology provided by Tom Helm and Alieda Stone.



**Clain Jones, Noelle Orloff, and David Weaver**, will present at the annual Crop and Pest Management School hosted on campus January 14-16.

## Future Team LRES

**Jennifer Watts**, LRES affiliate in the Spatial Sciences Center, received a \$270,000 grant from the NASA New Investigator Program in Earth Sciences. NASA NIP supports outstanding scientific research and career development of scientists using remote sensing.



Kaydence Martin



Owen Davis



**Merry Pacey**, LRES Administrative Assistant, retired this summer. We wish her well in her life in Idaho!



*Jane Mangold featured with lab members attend field tour at MPG Ranch in the Bitterroot Valley.*



August Storb



Emma Fox

# LRES Recognition



**Bob Peterson** gave his inaugural address as the new ESA president at the Entomological Society of America's closing session in Vancouver on November 18th.

**Brody Wallace** received an Undergraduate Research Scholarship from the Initiative for Regulation and Applied Economic Analysis.



**Luke McKay**, Assistant Research Professor, was featured in the documentary "The Most Unknown" presented at MSU on October 19th.



**Tracy Sterling** was honored as one of MSU's "125 Extraordinary Ordinary Women".

Her story was presented as part of the Herstory of Montana State University at the Diversity Symposium.

MSU CollegeofAg @MSUCollegeofAg  
Worrisome levels of soil acidity have been documented in 20 Montana counties. #MontanaState soil scientists are encouraging statewide crop growers to be diligent about soil testing to avoid low yields and even crop failure. <https://bit.ly/2NpOWdA>

**Clain Jones and Rick Engel's** article on Soil Acidification received the most impressions at 4,595 for the 2018 @MSUCollegeofAg Twitter feed.



**Susan Massar**, LRES graduate, received a Fulbright Scholarship to study in Chile.



The Institute on Ecosystems, directed by **Bruce Maxwell**, hosted three Distinguished Lecturers this semester. Our first was visiting researcher Dr. Paul West from the University of Minnesota's Institute on the Environment, who spoke about how to sustainably feed a growing population on a warming planet. Our second lecturer was Dr. Clayton Marlow, a Professor in the MSU Department of Animal and Range Sciences, who gave a talk on conserving the grass and shrublands of the Greater Yellowstone Ecosystem. Our final lecturer of the semester was Dr. Andrea Litt, an Associate Professor in the MSU Department of Ecology. Dr. Litt's lecture focused on bats and the work she and others are doing to help bat conservation efforts across the state of Montana. Thank you to everyone who came to this semester's events, and we are looking forward to next semester's Distinguished Lecturer series!

**Shavonn R. Whiten** (MS LRES '14) successfully defended her dissertation at Texas A&M. Her research involved cutting-edge gene editing technology.

## New LRES Staff



**Madison Boone** was hired on as the Program and Communication Manager for MSU's Institute on Ecosystems.



**Kristen Burr** is the Administrative Associate for the Western SARE program.



**Sherry Heis** is the Accounting Associate III for the Western SARE program.

**Woodrow Kenyon** is the Student Office Assistant for the LRES main office.



**Allison Milodragovich** is the Project Manager for the Western SARE program.



**Jen von Sehlen** is the Fiscal Manager for the Western SARE program.



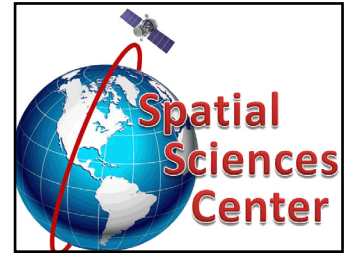
**Dorie Seymour** is the new Administrative Associate IV for the LRES main office.



## New Faculty: Mr. Nicholas Fox

### Continued...

While it may seem that my career path was focused, it was not until I started practicing geology and Geographic Information Systems (GIS) professionally did my horizons broaden. Through consulting I was able to wear many hats, geographer, geologist, mediator, and economist. I was exposed to all facets of the Oil and Gas industry from exploration to reclamation. After 5 years I hit a plateau, at least to my thinking, and decided to pursue a higher degree, which led me to Montana State University.



In the Summer of 2014 my wife (then fiancé) and I booked the movers, gave notice to our employers, and headed west to a place we had never laid eyes on, to a townhouse we found through facetime, and on path that would ultimately lead to where I am now: baby girl, lovely wife, dog (who thinks he is a mountain goat), and house.

My academic interests started when I took over for Stuart Challender, teaching GPHY 284, GPHY 384, GPHY 484, and GPHY 504 in the Earth Sciences department. I exponentially grew through working with the various students enrolled, encompassing 75 different majors. My focus moved from rocks and my interests grew to ecosystem scale spatial issues. I was delighted at the opportunity to try and fill Diana Cooksey's shoes and help progress GPHY 357: GPS Fundamentals and Applications in mapping and ENSC 110: Environmental Science. I will also continue to support GIS instruction in GPHY 284 (Spring), which we have big plans for!

Come knock on my door – Leon Johnson 245 – I am always looking for new ways to apply GIS and GPS in student research. It's a great opportunity to modernize course material and labs and to learn from each other!

*Nicholas Fox, Instructor*

## Professional Spotlight

### Dr. Qian Wang, Postdoctoral Fellow



Postdoctoral Fellow, Dr. Qian Wang, has a long working collaboration history with Tim McDermott, beginning while she was still conducting her PhD graduate work at Huazhong Agricultural University, in China (with Dr. Gejiao Wang, recent sabbatical visit). This earlier work was focused on arsenic – microbe interactions and was highly productive, generating five peer-reviewed publications. Their collaboration continued when in 2016 McDermott (and John Dore) acquired an NSF grant to work on aerobic methane synthesis in Yellowstone Lake.

This represented a marked change in her research portfolio, providing her with significant and new field research experience. She rapidly generated data concerning how methylphosphonate is converted to methane (Wang et al. 2017, Environ. Microbiol. 19:2366-2378), and then has continued efforts taking the lead on a project that now illustrate how methylamine is also converted to methane (submitted). This latter study was in collaboration with the Brian Bothner group, John Dore, and LRES PhD student Abdullah Alowaifeer. Together they

characterized methylamine concentrations in a freshwater lake, microbial community metabolic potential to carry-out the conversion to methane, along with characterizing the lake microbes, gene and encoded enzyme involved.

She then shifted to work on an NIH RO1 grant that McDermott shares with Seth Walk (PI, Microbiology & Immunology) that examines the influence(s) of the gut microbiome on host exposure to ingested arsenic. Here she is responsible for all molecular genetic-based efforts targeting the cloning and manipulation of genes into specific bacteria that are then mono-associated with germ free mice to assess the influence of microbial arsenic transformations on host metabolism and biochemistry.

In 2019, Qian is scheduled to go back China to start up her own research group. She will be sorely missed.

*Timothy McDermott, Professor*

## LRES Online M.S. Program Delivers Access to Students in Wild Places

**Marni Rolston, LRES Online Program Manager**



In 2017, the online Master's program in Land Resources and Environmental Sciences was awarded the second highest ranking out of 112 environmental science programs offered online by SR Education Group. Bob Peterson, founder and program director, describes the program components as "approximately 15 courses which includes activities, discussions, readings and exercises that students can access online any time that suits them". One student described the program as "so flexible... the professors were all great. There were a bunch of days when we had helicopter surveys and airplane flights so we asked to get the materials ahead of time because we knew the next week would be terrible".

The program is now in its seventh year and has been so successful that it now has 70 active graduate students and has graduated 52! Because of this success, Marni Rolston has joined us as Program Manager. Marni is a 20-year employee of Montana State University and received her M.S. in Entomology from Montana State in 1998.

In that capacity, she manages all aspects of the program across student recruitment, student registration, student support, and program support by working with faculty and academic units relative to specific courses and programs. She develops, organizes, and coordinates all logistical and administrative information and processes to maximize program success. Marni also facilitates and modifies as needed academic policies and procedures, curriculum and program development, university business practices, marketing, customer service, and continuous process improvement.

Marni is located in 123 Linfield Hall. For information about the program, contact Marni Rolston at [mrolston@montana.edu](mailto:mrolston@montana.edu) or 406-994-2029.

*Bob Peterson, Professor*

Quotes apted from:

<http://www.montana.edu/news/18135/msu-online-program-in-environmental-sciences-delivers-access-to-students-in-wild-places>

## GPHY 357: Service Learning, Art, and GNSS



*Instructor Fox (far right) and LRES students from the Urban Planning GPS Service Learning class met with Bozeman mayor, Cyndy Andrus (fifth from the right).*

The LRES Urban Planning GPS Service Learning Class has been working with the City of Bozeman GIS (COB GIS) Department since the fall of 2003. Traditionally the collaboration has focused on E-911 mapping and received multiple awards and recognition. With the advent of new technology the students are no longer limited to GPS and now have access to the full suite of GNSS constellations (U.S., Russia, Europe, China, and soon Japan).

The art project collaboration came to fruition via the pre-established framework of our collaboration with COB GIS and the addition of COB neighborhoods (Tanya Andreason) and the Epic Model Program (Susan Gallagher). The idea of the Epic Model is to improve local government and educational institution collaboration by streamlining the sharing of ideas, logistics, and contracts.

In-line with the Mayor's goal of sharing COB's art installation collection with the greater community, we were able to expose students to new software and hardware, and a unique application of GNSS mapping techniques they learn as part of GPHY 357.

*Nicholas Fox, Spatial Sciences Instructor*

Find the map here:

<https://bozeman.maps.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=3b63dcf000db4393be4656591f814f32>

# New LRES Graduate Students

2018

## Master of Science

**Sydney Atencio**

*M.S. LRES*

*Advisor: Miller*

**Laissa Cavallini dos Santos**

*M.S. ENTO*

*Advisor: Weaver*

**Mary Ellyn DuPre**

*M.S. LRES*

*Advisor: Menalled*

**Shelly Green**

*M.S. LRES*

*Advisor: Zabninski*

**Simon Fordyce**

*M.S. LRES*

*Advisor: Jones*

**Shealyn Malone**

*M.S. LRES*

*Advisor: Menalled*

**Jordan Meyer-Morey**

*M.S. LAND*

*Advisor: Rev*

**Kristen Oneill**

*M.S. LRES*

*Advisor: Hartshorn*

**Laura "Tindall" Ouverson**

*M.S. LRES*

*Advisors: Menalled & Seipel*

**Mei Ling Wong**

*M.S. LRES*

*Advisor: Menalled*

## Doctor of Philosophy

**Peter Bugoni**

*Ph.D. ESEC*

*Advisor: Mangold*

**Hannah Duff**

*Ph.D. ESEC*

*Advisor: Maxwell*

**S. Katie Fogg**

*Ph.D. ESEC*

*Advisor: Poole*

**Paul Hegedus**

*Ph.D. ESEC*

*Advisor: Maxwell*

**R. Sasha Loewen**

*Ph.D. ESEC*

*Advisor: Maxwell*

## Online Master of Science

**Chris Bilbrey**

*M.S. LRES Online*

*Bozeman, MT*

**Kevin Cofer**

*M.S. LRES Online*

*Missoula, MT*

**Christianne Fisher**

*M.S. LRES Online*

*Bismark, ND*

**Sierra Gould**

*M.S. LRES Online*

*Castle Rock, CO*

**Nathaniel Gronewold**

*M.S. LRES Online*

*Houston, TX*

**Virginia Hamilton**

*M.S. LRES Online*

*Asheville, NC*

**Nathanael Johns**

*M.S. LRES Online*

*Bozeman, MT*

**Katelyn Little**

*M.S. LRES Online*

*Belgrade, MT*

**Brianna Niehoff**

*M.S. LRES Online*

*Helena, MT*

**Robyn Skillman**

*M.S. LRES Online*

*Shelby, MT*

**Heather Supplee**

*M.S. LRES Online*

*Coudersport, PA*

**Robert Tan**

*M.S. LRES Online*

*Seattle, WA*

**Madelyne Willis**

*M.S. LRES Online*

*Atlanta, GA*

ESEC: Ecology & Environmental Sciences  
LAND: Land Rehabilitation  
LRES: Land Resources & Environmental Sciences  
ENTO: Entomology



## LRES Faculty/ Staff & Student Winter Social

Martin Luther King Day  
January 21, 2019  
at CrossCut Ranch

Stay tuned for details...





## Dr. Qiaoyun Huang Visits LRES



*From left to right: Tim McDermott, Prof. LRES, Dr. Qian Wang, Postdoc in McDermott lab and future faculty member in Huazhong Agricultural University, Dr. Huang and his family.*

In August, Dr. Qiaoyun Huang, center in photo, Soil Biochemist from Huazhong Agricultural University (HAU), visited Land Resources and Environmental Sciences. He had recently presented his research at the Goldschmidt 2018 in Boston and stopped at MSU on his return trip to China. In addition to running a vibrant research group, he is interested in establishing collaborative ties with MSU scientists. Further, Dr. Huang is a Dean-level administrator in HAU's College of Agriculture and expressed interest in developing a joint education program with LRES. That goal is currently in the works, with a preliminary plan to initiate this program with a small cadre of Huazhong Agricultural University students coming to MSU for a summer short course on soil science and Yellowstone geology. There may be interesting opportunities for interested faculty to participate in this course as well as possibly teaching courses in China. Stay tuned!

*Tim McDermott, Professor*

## NIEH Workshop

Tim McDermott and Seth Walk (Microbiology and Immunology) co-hosted an NIEH-funded workshop entitled "Metabolism of Environmental Toxicants by the Gut Microbiome". Participants (~50 in total) were from throughout the United States. A focal point for this workshop was to gather experts representing various aspects of human gut –

microbiome interactions, and how these interactions influence host toxicity and exposure to environmental arsenic and mercury. By all accounts, including numerous follow-up communications, this workshop was a complete success at numerous levels. MSU graduate students and postdocs got excellent exposure in terms of short presentations as well as gaining considerable knowledge from the various experts. In addition to the great science, Tim & Seth hosted a Montana BBQ, where out-of-town guests were treated to the finest cuts of antelope, deer and elk (we may have converted a vegetarian) and some impromptu music. And, following the workshop, most attendees stayed over an additional day for social activities that included their choice of rafting on the Yellowstone, hiking in Paradise Valley or a day trip into the Park. The workshop was capped off by everyone meeting at "Follow Yer Nose" in Emigrant, Montana, for a festive gathering. Seth & Tim acknowledge local support from Dean Boyer, Mark Jutila and Tracy Sterling.



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*Tim McDermott, Professor*

## Climate Assessment Class Tour

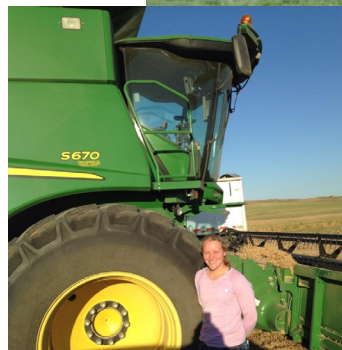


*Scott Powell and Tony Hartshorn (3rd and 4th from left, respectively), led a group of 20 incoming MSU Honors' students on a 3-week field course of climate change issues around the state of Montana. Pictured here is the full class along the length of a wind turbine at the Judith Gap Wind Farm. Other class highlights included hiking to the fast-receding Grinnell Glacier in Glacier National Park and meeting with elected officials in Helena.*

## Rangeland Resource Committee Internship

This past summer was spent as one of two Montana Rangeland Resource Committee interns with the state's Department of Natural Resources and Conservation (DNRC). This experience blew this Montana native away. I gained extensive agricultural knowledge and skills, learned about Montana's history, and witnessed incredible landscapes. But the most impressive part was the people and communities I met and worked for... Becoming part of Montana's rural communities gave me a good look at agriculture while gaining an understanding of the origin of the common Montana spirit: community and devotion- to one another and the land.

As I begin my junior year at Montana State University, I am looking forward to taking lessons learned from my Rangeland internship and applying them to my classes in the Land Resources and Environmental Sciences department. This experience has energized my interest in agriculture and given me a new perspective on how I can help landowners and producers take care of their land and resources while providing for their families and communities. This internship not only gave me invaluable lessons about agriculture, it also taught me how to be a good neighbor and work collaboratively with those around me to promote a common good.



*Abigail Northrup*

Adapted from: <http://prairiepopulist.org/dnrc-internship/>



## Call for abstracts coming for the Spring LRES Research Colloquium

The 9th Annual LRES Research Colloquium will be held in the Strand Union Ballrooms C & D on **April 17, 2019** (more details coming soon).

The event offers on-campus and online graduate and undergraduate LRES students an opportunity to present their research to friends, colleagues, and faculty in an informal setting. All LRES undergraduate and graduate students are encouraged to submit a poster and/or oral presentation. Travel grants are available to assist online M.S. students who would like to participate. Come and share what you have been working so hard on!

Other highlights of the Colloquium include a keynote speaker, door prizes, and prizes for the best presentation(s). Appetizers and beverages will be served.

Questions? Interested in helping organize the event?

Email [lresgso@gmail.com](mailto:lresgso@gmail.com) or touch base with current **LRES GSO Leadership**:

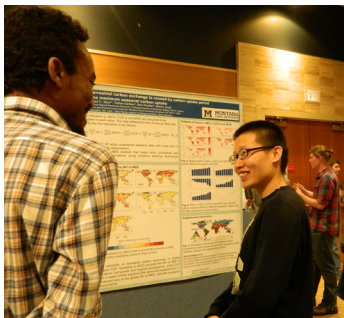
**Co-Chairs:** Jordan Meyer-Morey & Paul Hegedus

**Mentoring Committee Chair:** Hannah Duff

**Curriculum Committee Chair:** R. Sasha Loewen

**Social Committee:** Gabe Bromley

**Online Student Rep:** Kelsey Smith



Graduate students Zheng Fu and Fasil Worku discuss a poster on terrestrial carbon at Spring 2018 event.

## LRES Capstone

Early in this semester the LRES Capstone class invited land use planners and managers from local and county governments to meet at the Bozeman Public Library. During that meeting those planners asked the class to address a suite of questions around the potential conflicts between natural resources and urbanizing Gallatin County (including Bozeman and Belgrade).



Over the semester the students researched those questions and focused on 4 major subjects:

1. Prioritizing Wetlands for the Future of Bozeman
2. Landscape Disturbance Index to Evaluate the Best Places to Develop in Gallatin County
3. Low-Impact Development to Mitigate Urbanization Stress on Natural Resources
4. The Effect of Urbanization on Groundwater Within the Greater Gallatin Valley

In late November, the Capstone students presented their findings back to those planners and managers and will follow up with final reports at the end of the semester. The students also presented to the LRES freshmen to show how their education can be beneficial to our community after they finish their degree programs.

*William Kleindl, Assistant Research Professor*

## Fuel Up for Finals

LRES “Fuel up for Finals” Open House, co-hosted by the LRES Undergraduate Club and Graduate Student Organization, was held on Monday, December 10th in LRES 325. This year-end event had an open and social atmosphere with students sharing their plans for winter break and enjoying a reprieve from studying. Pizza and refreshments were served.

## 2019 Upcoming Student Events

January 21- Martin Luther King Day LRES Winter Social

February 23- I ♥ LRES Bowling Night

March 6- LRES Research Mixer

April 17- LRES Research Colloquium

# LRES Degrees Awarded Fall 2018

## *Bachelor of Science*

### **Environmental Biology**

*Noelani Boise, with Highest Honors*

*Leah Simantel, with Highest Honors*

### **Environmental Sciences**

*Betsy French*

*Jacklynn Lathrop, with Honors*

*Laura Mooney*

*Stephanie Neises*

### **Geospatial & Environmental Analysis**

*Zane Ashford, with Highest Honors*

### **Soil & Water Science**

*Taylor Zabel*

### **Sustainable Foods & Bioenergy**

### **Systems-Agroecology**

*Althea Hogle*



## *Master of Science*

### **Land Resources & Environmental Sciences**

*Emma Bode (Summer)*

*Florence Miller*

## *Online Master of Science*

### **Land Resources & Environmental Sciences**

*Alexis Bengé (Summer)*

*Jennifer Malavasi (Summer)*

*Eric Martin*

*Bradley Newman*

*Leewood Oakley (Summer)*

*Cameron Sapp (Summer)*

*Andrew Ulven*

*Tona Van Der Hiele (Summer)*

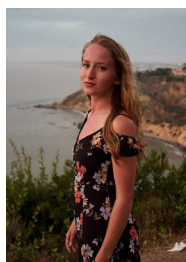
*Amy Watrud (Summer)*

*Left: Professors Lawrence, Ewing, Payn and Powell during Spring '18 graduation ceremony. Middle: Dean Boyer addressing the students. Right: Rachel Phipps (middle) posing with her advisor Rick Lawrence and Linda McDonald during Spring '18 graduation.*

## **College of Agriculture Outstanding Undergraduate Student Awardees**

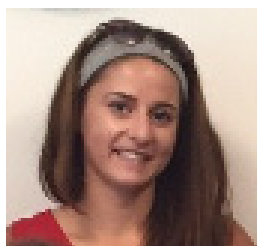
The purpose of the College of Agriculture Outstanding Undergraduate Student Awards is to recognize student accomplishment above and beyond in the areas of Leadership, Engagement, and Research. Students were recognized at the Fall College of Agriculture Scholarship and Awards Banquet on November 9th.

### **CoA Outstanding Undergraduate Engagement Awardee**



**Noelani Boise**  
Major: Environmental Sciences-  
Environmental Biology  
Advisor: Inskip

### **CoA Outstanding Undergraduate Research Awardee**



**Laura Ippolito**  
Major: Sustainable Foods and Bioenergy Systems- Agroecology  
Advisor: Maxwell



# New LRES Grants Awarded from Dec. 2017 - Nov. 2018

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 **in bold** on their meaningful work and impressive accomplishments.

## Federal Grants

### National Aeronautics and Space Administration (NASA)

**Maxwell & Ewing** Satellite-guided hydro-economic analysis for integrated management and prediction of impact of droughts on agriculture regions

### National Institutes of Health (NIH)

**McDermott** Environmental toxins and the gut microbiome

### National Park Service (NPS)

**Maxwell** Provide technical and professional assistance to the Greater Yellowstone Network  
**Rew** Determining approaches to manage desert alyssum and improve sagebrush steppe communities  
**Ewing** Uranium and strontium isotope analysis of water for Arctic network stream communities and ecosystems vital signs

### National Science Foundation (NSF)

**D'Andrilli & Payn** Collaborative Research: Application of fluorescence spectroscopy for the characterization of dissolved organic matter: Disentangling common misconceptions and underlying chemistry

**Trowbridge** Collaborative Research: How to live on a (carbon and water) budget: Tree investment in chemical defenses across a gradient of physiological drought stress

### USDA Animal And Plant Health Inspection Service (APHIS)

**Littlefield** Rearing, release, and monitoring of *Aceria drabae* for the biological control of hoary cress **USDA**

### National Institute of Food and Agriculture (NIFA)

**Burrows & Miller (Co-PI)** Building a better lentil from the ground up

**Menalled, Seipel, Trowbridge, Weaver, Bourgault, & Yeoman** Diversifying cropping systems through cover crops and targeted grazing: Impacts on plant-microbe-insect interactions, yield and economic returns

**Reinhold** Investigating potential hydrogeomorphic influences on Russian olive invasions on the Yellowstone river floodplain

**Jones, Miller, Bourgault, & McPhee** Increasing nitrogen fixation potential in pulses for environmental and economic sustainability

**Maxwell (Co-PI)** Advancing an inclusive food systems curriculum based on a signature pedagogy  
**Carr, Menalled, Miller, & Seipel** CREEP STOP: Integrating biological, cultural, and mechanical/physical tools for long-term suppression of creeping perennial weeds in northern Great Plains and Pacific Northwest cropping systems

**Menalled** Western SARE Host Institution (See <http://www.montana.edu/news/17438/msu-named-regional-host-of-national-sustainable-agriculture-program-western-sare>)

### US Fish and Wildlife Service (USFWS)

**Maxwell** Science applications strategic communications and science outreach cooperative agreement

### US Geological Survey (USGS)

**Maxwell** Ecological statistics to support monitoring programs in the Western US

## Montana Grants

### Montana Fertilizer Assessment Fund

Engel & Jones	Understanding acidification and management of Montana soils
Ewing, Brookshire, & Payn	Research Analytical Chemist, Environmental Analytical Laboratory
Miller, Jones, & Zabinski	Advancing cover crop knowledge in Montana: Soil fertility implications
Miller, Ewing, & Jones	Long-term N management in alternative crop rotations
Maxwell	On-farm experiments to optimizing site-specific application of nitrogen fertilizer rates to maximize producer profits

### Montana Noxious Weed Trust Fund

Littlefield	Biological control of Russian knapweed: Host testing and agent monitoring
Littlefield	Host testing of gall wasp for the biocontrol of invasive hawkweeds
Littlefield	Host testing and field release of biocontrol agents for whitetop
Littlefield	Host screening of new biocontrol agents for common tansy and oxeye daisy
Mangold & Frame-Martin	Montana Noxious Weed Education Campaign
Mangold (Co-PI)	Keeping it fresh: Revising weed publications

Mangold, Frame-Martin, & Raile Noxious weeds survey: Has 20+ years of weed education been effective?

Weaver	Mass rearing, release, and monitoring of the northern tamarisk leaf beetle ( <i>Diorhabda carinulata Desbrochers</i> ): A biological control agent for saltcedar
Weaver	Increasing effective options for integrated management of invasive toadflax
Weaver	Continuing development of candidate agents for biological control of Russian olive

### Montana Wheat & Barley Committee

Miller, Ewing, & Jones	Soil Carbon Accumulation in progressive montana crop rotations
Seipel & Carr	Many little hammers: Integrating crop diversity, crop variety, cover crops, and targeted grazing to chip away at herbicide resistant weeds in small grain cropping systems
Weaver	IPM of wheat stem sawfly and other insect pests of wheat

## Bayard-Taylor Scholarship Awardees

The Bayard-Taylor Scholarship Fund provides a stipend to support two Graduate Research Assistantships in the Environmental Analytical Laboratory (EAL) for graduate students contributing to the research support of full-time faculty in Land Resources and Environmental Sciences.



*FY 19 Awardee*  
*Advisor: Brookshire*

**Justin Gay's** research area is focused on the impacts of climate change on biogeochemical pathways in terrestrial ecosystems.



*FY 19 Awardee*  
*Advisor: Maxwell*

**Royden "Sasha" Loewen's** research area focuses on the use of on farm precision experimentation (OFPE) to improve management practices in organic grain farming.



## Private, University, Regional and Other State Grants

### Alfred P Sloan Foundation

Zabinski Telling the ecological and evolutionary story of food

### Confederated Tribes of the Umatilla Indian Reservation

Poole & Reinhold Multi-scale hyporheic exchange/regional water temperature project

### Montana Department of Agriculture

Littlefield Enhance mitigation of the Eastern heath snail, *Xerolenta obvia*, in Montana

### Montana Department of Environmental Quality

Sigler Volunteer water quality monitoring support 2018-2019

### Montana State University: Provost Office Faculty Excellence Grant

D'Andrilli POLAR2018: Where the poles come together

O'Neill Diversity and Behavior of Orchid Bees of Belize

Rew Ecological Statistics: Application of Zero-Inflated Models to Ecological Data with R

Trowbridge 2019 Plant-Herbivore Interaction Gordon Research Conference

### University of Hawaii- Manoa

Dore MSU Subcontract: HOT inorganic carbon program and data QA/QC

### University of Illinois Urbana-Champaign

Maxwell Montana data-intensive farm management

### University of Montana

Ewing & Payn NSF EPSCoR Consortium for Research on Environmental Water Systems (CREWS) Year-1

### USA DRY Pea and Lentil Council

E.Davis & Menalled 2018 Weed control in dry pea and lentil

### Utah State University

Ewing, Jones, & Sigler A predictive framework for investigating nitrogen dynamics in leaching-susceptible soils

Miller, Dagati, Jones, & Zabinski Advancing cover crop knowledge: Assessing the role of plant diversity on soil change

### Yellowstone Forever

Maxwell Fisheries technician support in Yellowstone National Park, 2018-2019

## Nielsen Graduate Research Assistantship Awardee

The Nielsen Graduate Research Assistantship is awarded to graduate students providing research support to full-time faculty in soil science, specifically *Montana Pedogenesis*, or the basic understanding of Montana soils.



*FY 2018 Awardee*

*Advisors:*

*Tony Hartshorn & Bill Kleindl*

**Bree Whitehead's** M.S. thesis investigates riparian restoration and hydric soil development in the Centennial Valley. Her topic focuses on: "In what way does Beaver Dam Mimicry affect the hydrological connection between the stream and the parafluvial system? Do these channel alterations provide conducive conditions for hydric soil development?"

# LRES 2018-2019 Scholarship Recipients

## Battle Ridge Ranch Scholarship

*Emily Daniels*

## Bill & Anita Jones Agricultural Scholarship

*Jacob Martin*

*Abigail Northrup*

*Vanessa Orcutt*

*Natalie Sturm*

*Jacob Zimmerer*

## BMCF Agricultural Scholarship

*Noelani Boise*

*Joshua Botti-Anderson*

*Elizabeth Rieger*

## Thomas D. Campbell Memorial Scholarship

*Noelani Boise*

*Seth Page*

*Shane Richardson*

## Charlotte Rose Hughes Memorial Scholarship

*Hadley Barnard*

*Daniel Chichinsky*

*Althea Hogle*

*Kristin Katchmar*

## CHS Foundation Scholarship

*Emily Daniels*

## College of Agriculture Recruitment Scholarship

*Makayla Driskell*

## Rafter D. Ranch, Ed and Kalli Deschamps Scholarship

*Natalie Sturm*

## Clyde & Helen Erskine Fund for Excellence in Agriculture

*Daniel Huck*

## Farmers Business Network Scholarship

*Kristin Katchmar*

*Hetta Williams*

## Ted & Thelma Fosse Scholarship

*Elena Marburger*

## Hayden Agriculture Scholarship

*Lars Heinstdt*

## Koebel Family Scholarship

*Jaydyn Engan*

*Josephine Rodrigue*

## Land Resources Stewardship Scholarship

*Daniel Chichinsky*

*Elfrida Isaksen-Svensen*

*Katya Koepsel*

*Madelene Lockner*

*Seth Page*

## John S. McFarlane Scholarship

*Jacob Zimmerer*

## Cliff Montagne LRES Scholarship

*Stacey Robbins*

## Nielsen Graduate Research Scholarship

*Briana Whitehead*

## Arthur H. & Margaret C. Post Scholarship

*Kristen Bancroft*

## August and Mary Sobotka Memorial Agriculture Award

*Megan Deming*

## Rene Jones Lock Scholarship

*Hadley Barnard*

## 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 (406-994-4815 or [kbrown@msuaf.org](mailto:kbrown@msuaf.org)).



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Land Resources & Environmental Sciences