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).
**LRES Recognition**

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

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.

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

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.

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

**Milestones in Service**

Jeff Littlefield- 30 yrs  
Rosie Wallander- 25 yrs  
Dorie Seymour- 10 yrs  
Shantell Frame-Martin- 5 yrs

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

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

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

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

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

**Future Team LRES**

Kaydence Martin  
Owen Davis  
August Storb  
Emma Fox
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.

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.

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

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!

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.

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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 lead 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 sl. 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 or 406-994-2029.

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

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=3b63df00db4393be465691f814f32
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: Rew

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
Bismarck, 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...
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!

**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.

**Tim McDermott, Professor**
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/

Rangeland Resource Committee Internship

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.

Climate Assessment Class Tour
**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 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

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**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*

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**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.

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**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
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 Benge (Summer)
Jennifer Malavasi (Summer)
Eric Martin
Bradley Newman
Leewood Oakley (Summer)
Cameron Sapp (Summer)
Andrew Ulven
Tona Van Der Hiele (Summer)
Amy Watrud (Summer)

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: Inskeep

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 |
| 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 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 (*Diorhabda carinulata Desbrochers*): 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**
Adviser: Brookshire
Justin Gay’s research area is focused on the impacts of climate change on biogeochemical pathways in terrestrial ecosystems.

**FY 19 Awardee**
Adviser: 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 Hawai‘i - 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

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**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

<table>
<thead>
<tr>
<th>Scholarship</th>
<th>Recipients</th>
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<tbody>
<tr>
<td>Battle Ridge Ranch Scholarship</td>
<td>Emily Daniels</td>
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<tr>
<td>Bill &amp; Anita Jones Agricultural Scholarship</td>
<td>Jacob Martin, Abigail Northrup, Vanessa Orcutt, Natalie Sturm, Jacob Zimmerer</td>
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<tr>
<td>BMCF Agricultural Scholarship</td>
<td>Noelani Boise, Joshua Botti-Anderson, Elizabeth Rieger</td>
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<tr>
<td>Thomas D. Campbell Memorial Scholarship</td>
<td>Noelani Boise, Seth Page, Shane Richardson</td>
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<td>Charlotte Rose Hughes Memorial Scholarship</td>
<td>Hadley Barnard, Daniel Chichinsky, Althea Hogle, Kristin Katchmar</td>
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<tr>
<td>CHS Foundation Scholarship</td>
<td>Emily Daniels</td>
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<tr>
<td>College of Agriculture Recruitment Scholarship</td>
<td>Makayla Driskell, Rafter D. Ranch, Ed and Kalli Deschamps Scholarship, Natalie Sturm</td>
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<td>Clyde &amp; Helen Erskine Fund for Excellence in Agriculture</td>
<td>Daniel Huck</td>
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<td>Farmers Business Network Scholarship</td>
<td>Kristin Katchmar, Hetta Williams</td>
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<td>Ted &amp; Thelma Fosse Scholarship</td>
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<td>Hayden Agriculture Scholarship</td>
<td>Lars Heinstedt</td>
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<td>Koebel Family Scholarship</td>
<td>Jaydyn Engan, Josephine Rodrigue</td>
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<td>Land Resources Stewardship Scholarship</td>
<td>Daniel Chichinsky, Elfrieda Isaksen-Swensen, Katya Koepsel, Madelene Lockner, Seth Page</td>
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<td>John S. McFarlane Scholarship</td>
<td>Jacob Zimmerer</td>
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<td>Cliff Montagne LRES Scholarship</td>
<td>Stacey Robbins</td>
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<td>Nielsen Graduate Research Scholarship</td>
<td>Briana Whitehead</td>
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<td>Arthur H. &amp; Margaret C. Post Scholarship</td>
<td>Kristen Bancroft</td>
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<td>August and Mary Sobotka Memorial Agriculture Award</td>
<td>Megan Deming</td>
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<tr>
<td>Rene Jones Lock Scholarship</td>
<td>Hadley Barnard</td>
</tr>
</tbody>
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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).