



Rocky Mountains

Cooperative Ecosystem Studies Unit

Research, Education & Technical Assistance

NEWSLETTER

March - April 2018

RM-CESU NEWS & EVENTS



Kerri Keller Clement



Leah Joyce



Morgan Voss

2018 Glacier National Park Conservancy - Jerry O'Neal Research Fellowship Awardees Announced

This fellowship honors Jerry O'Neal's, former deputy superintendent at Glacier NP, dedication to science and research. The Fellowship supports graduate and upper undergraduate student research in the Crown of the Continent Parks: Glacier NP, Grant Kohrs Ranch NHS, and Little Bighorn Battlefield NS. The 2018 fellowships were made possible by generous support from the Glacier National Park Conservancy and the Crown of the Continent Research Learning Center. **This year's Fellowship recipients are:**

Kerri Keller Clement, PhD Candidate in History, University of Colorado Boulder, *Historic Livestock Patterns, Grant Kohrs NHS In* In her study, Kerri will first digitize the Park's historical livestock data. The digitized data will be inputted into network analysis software to analyze and visualize the economic and geo-political networks of the Ranch. NPS personnel will be able to use the data to inform decisions when considering cattle choices, haying and general land management for the Ranch.

Leah Joyce, Masters Candidate in Organismal Biology, Evolution, and Ecology, University of Montana, *Amphibian-Parasite Dynamics and Ecological Engineers in Glacier National Park, Montana* The focus of Leah's research is document and compare parasite abundance and prevalence among three species of pond-breeding amphibians in Glacier National Park: the boreal toad, the long-toed salamander, and the Columbia spotted frog. She aims to investigate how changes in the environment due to beaver presence can influence amphibian-parasite dynamics.

Morgan Voss, Masters Candidate in Geography, University of Montana, *Characterizing Avalanche Path Disturbance Regimes in Glacier National Park, Montana* Morgan's research will focus on applying remote sensing and GIS technologies to quantitatively characterize avalanche paths in the southern portion of Glacier National Park. Once refined, the geomorphological and ecological metrics will be applied to the rest of Glacier National Park to estimate the impacts of this disturbance across the landscape.

The RM-CESU Wishes Christine Ford, Curator at Grant Kohrs Ranch NHS, a Great Retirement

In western Montana, the National Park Service administers a small historic park known as Grant-Kohrs Ranch NHS (GRKO), in Deer Lodge. This park unit celebrates the range cattle grazing period of the 1800s. The resources staff at GRKO have been active supporters of the Rocky Mountains CESU and our partners since its inception in 1999. One of the NPS "power users" of the RM-CESU agreement has been Christine Ford, curator and Chief of Resources at GRKO. After several decades with the NPS Chris has retired to enjoy a leisurely tour in her trailer and some volunteering at parks of the American West. The folks at RM-CESU wish her an excellent retirement and want to thank her for all her efforts in working with students and faculty from an array of our universities.

Since Chris was primarily a cultural resource specialist, she began work with the RM-CESU by getting Montana State University students and principal investigators involved in designing and constructing an interpretive exhibit for the Ranch on "Ranching through Time". Her concern with the preservation of park collections and memorabilia led her to work with MSU pest management specialists to catalog and control insect pests in the museum storage areas. She shared the results of this work with participants at the George Wright Society meetings, and with other museum specialists in the Deer Lodge Valley. She was a champion for getting students of all disciplines to work as interns at the park, with a focus on getting students from Colorado State University and Montana State University work experience in the summers.



Over her NPS career Chris Ford was a champion for Grant Kohrs Ranch, RM-CESU partnerships, and students.

Chris encouraged the park to work with "non-traditional" partners, such as Montana Tech and Salish Kootenai College. She arranged for a graduate student from Montana Tech to investigate the hydrology of streams and irrigation ditches on the Ranch that often overflowed their channels to undermine historic structures. When the Ranch needed a partner to do an archeology survey, she approached SKC to provide native students to do the on-site work, and thus learn the ins-and-outs of doing archeological digs. She was an active participant in getting students to apply for grants through the Jerry O'Neal Fellowship fund. She mentored graduate and undergraduate students doing projects at the Ranch on such disparate topics as grassland bird nesting and cattle grazing, and digital analysis of livestock sales data to establish the trading networks that operated in the late 1800s.

Although the resources staff at GRKO is small Chris was always willing to take time out to give a tour, to assist students and faculty with their historical and museum projects, or to assist with the annual Deer Lodge Valley teaching training course sponsored by the NPS and the University of Montana. When the NPS CESU coordinators came to the University of Montana for their annual meeting in May 2009, Chris lead them on a field trip at the Ranch to see how this small NPS unit had benefitted from the RM-CESU partnership. She will be sorely missed by the NPS family and the RM-CESU partners.

Research Identifies Areas Where Evolution Could Rescue Animals Threatened by Climate Change

As winters arrive later and snow melts earlier, the worldwide decrease in snow cover already may have dramatic impacts on animals that change coat colors with the seasons. An international scientific team led by University of Montana Professor L. Scott Mills has set out to discover whether adaptive evolution can rescue these animals in the face of rapidly changing climate.

Twenty-one species of mammals and birds rely on the ability to change their coat color from brown in summer to white in winter to avoid fatal encounters with predators, but in some parts of their range individuals forgo the white molt and remain brown in winter.

"Weasels in the southern U.S. and mountain hares in Ireland, for example, have evolved to remain brown year-round," Mills said. "This is a genetic adaptation to retain camouflage in areas where snow is intermittent or sparse."

Mills' group previously found that winter white snowshoe hares confronting snowless ground have higher mortality rates that could drive massive population declines as snow duration continues to decrease. Other scientists have pointed to coat-color mismatch against snowless ground as a cause for recent range decreases of hares, ptarmigan and other species.



Brown and white snowshoe hares on snow at UM research facility (L.S Mills research photo by Jacob and Lindsey Barnard)

In a new article in *Science*, Mills' team identified areas that could foster rapid "evolutionary rescue" of these species particularly vulnerable to climate change. The study describes how the international team mapped "polymorphic zones" for eight color-changing species, including hares, weasels and the Arctic fox. In these zones, both brown and white individuals coexist in winter.

"These areas hold the special sauce for rapid evolutionary rescue," Mills said. "Because they contain winter-brown individuals better adapted to shorter winters, these polymorphic populations are primed to promote rapid evolution toward being winter brown instead of white as climate changes."

The authors emphasize that these hotspots for evolutionary rescue are not magic fortresses that will prevent climate change effects on wild animals.

"Ultimately, the world must reduce carbon dioxide emissions or else the climate effects will overwhelm the ability of many species to adapt," co-author Eugenia Bragina said. "But by mapping these adaptive hotspots, we identify places where people could help foster evolutionary rescue in the short term by working to maintain large and connected wildlife populations."

For this research, UM partnered with North Carolina State University, the University of Natural Resources and

Life Sciences in Vienna, the Universidade do Porto in Portugal, the German Remote Sensing Data Center, the Russian Academy of Sciences in St. Petersburg and Russia's Institute of Systematics and Ecology of Animals.

Five UM graduate students also were co-authors on the paper and part of the international research team.

For more information on the research, visit the [Mill's Lab](#).

The Montana portion of this research was supported partly by the Bureau of Land Management through the Rocky Mountains CESU.

PARTNER NEWS:

University of Utah: Citizen Science Birding Data Passes Scientific Muster As long as there have been birdwatchers, there have been lists. Birders keep detailed records of the species they've seen and compare these lists with each other as evidence of their accomplishments. Now those lists, submitted and aggregated to birding site [eBird](#), can help scientists track bird populations and identify conservation issues before its too late.

Joshua Horns is an eBird user himself and a doctoral candidate in biology at the University of Utah. In a paper published today in *Biological Conservation*, Horns and colleagues report that eBird observations match trends in bird species populations measured by U.S. government surveys to within 0.4 percent.

Many nations don't conduct official bird surveys, Horns says. "In a lot of tropical nations that's especially worrisome because that's where most birds live." But he's now shown that eBird data may be able to fill that gap.

The full study can be found [here](#).

USGS: Greater Sage-Grouse Science (2015-2017): Synthesis and Potential Management Implications

At the request of the BLM, the USGS worked with federal and state agency partners to develop a report that synthesizes the scientific literature published since records of decision were completed for 2015 BLM/USDA Forest Service land use plan amendments for greater sage-grouse, and provides potential management implications of the science. Read more about it [here](#).

CALENDAR:

April 10-11, 2018: *Great Plains Grassland Summit*, Denver, CO. The objectives of the 2018 Great Plains Grassland Summit are to convene an opportunity for managers, scientists and stakeholders to learn about and contribute to ideas, knowledge, and plans for managing, conserving and restoring grasslands through collaborations across boundaries in the Great Plains. [Summit Website](#)

April 23-26, 2018, *2018 National Outdoor Recreation Conference - Building Resilient Communities, Environments and Economies*, Burlington, VT. Outdoor recreation infrastructure and opportunities are now acknowledged as the catalysts for engaging current and future land stewards, building strong local economies, and contributing to a sense of community and belonging. Our location of Vermont provides an ideal location to see how investments in local conservation and outdoor recreation have contributed to a thriving economy and vibrant community. [2018 National Outdoor Recreation Conference Website](#).

May 21-24, 2018: *The Fire Continuum Conference - Preparing for the future of Wildland Fire*, Missoula, MT. The conference will be designed around the fire management continuums. We invite you to participate in this

journey through the range of science and management activities that take place before a wildfire occurs, activities needed during a wildfire event, and the post fire activities and fire ecology. The continuum theme will resonate throughout the conference by emphasizing the fire experience, education, ecology, and management gradients. **Fire Continuum**.

July 21-26, 2018: North American Congress for Conservation Biology - Conservation Science, Policy, and Practice: Connecting the Urban to the Wild, Toronto, Canada. **NACCB 2018 Website**

September 11-14, 2018: 14th Biennial Scientific Conference on the Greater Yellowstone Ecosystem, Big Sky, MT. The conference focuses on the human experience and the role scientific research and communication play in the future of wild places like the Greater Yellowstone Ecosystem. **Tracking the Human Footprint**

JOB OPPORTUNITIES

For details, visit **Job Opportunities**

Geoscience Manager-Digital Mapping Laboratory, University of Idaho, Moscow, ID (closes 4/16/2018)

Clinical Faculty (emphasis historical archaeology), University of Idaho, Moscow, ID (closes 4/11/2018)

Wildfire Mitigation Program Specialist, Colorado State Forest Service, Fort Collins, CO (closes 4/8/2018)

Postdoctoral Researcher (investigating the impacts of increasing climate variability on rangeland production across western United States), Ecology Center, Utah State University, Logan, UT (closes 4/8/2018)

Cultural Anthropologist (Native American cultures of the North American Plateau regions), University of Idaho, Moscow, ID (closes 4/6/2018)

Veterinary Intern-Animal Welfare & Wildlife Rehab Project, Washington State University, Pullman, WA (closes 4/2/2018)

Assistant Professor, Ecosystem Science and Management, University of Wyoming, Laramie, WY (closes 3/30/2018)

Postdoctoral Fellow (conduct social and ecological research on cross-boundary mitigation of habitat for threatened and endangered species in a rapidly changing environment), Colorado State University, Fort Collins, CO (closes 3/25/2018)

If you would like to post an announcement in the next RM-CESU Newsletter or on the website, please contact the RM-CESU Coordinator at rmcesu@cfc.umt.edu.