



Rocky Mountains

Cooperative Ecosystem Studies Unit

Research, Education & Technical Assistance

NEWSLETTER January-February 2018

RM-CESU NEWS & EVENTS

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



Glacier National Park



Grant-Kohrs Ranch NHS



Little Bighorn Battlefield

Thanks to generous support from the Glacier National Park Conservancy, the Jerry O'Neal NPS Student Fellowship has merged to become the Glacier National Park Conservancy - Jerry O'Neal Research Fellowship

Applications are now being accepted for the **Glacier National Park Conservancy - Jerry O'Neal Research Fellowship** for work in Glacier National Park, Grant-Kohrs Ranch NHS, and Little Bighorn Battlefield NM. The fellowship aims to provide educational assistance for students seeking to understand natural and cultural resources issues and how these interact with human values. Special consideration will be given to proposals that address the following:

1. natural resource issues such as aquatic ecology, terrestrial ecology, fire ecology, invasive plants, and climate change
2. cultural resource issues, such as history and architectural studies, cultural landscape reports, ethnographic research and archeology
3. social science that informs resource management about a natural or cultural topic and/or that addresses visitor impacts to park resources

Competition is open to graduate students or superior upper division undergraduate students at RM-CESU universities and colleges only. Awards range from \$1000-5000. Applications must be submitted electronically by February 19, 2018. [Application Process](#)

Boyd Evison Student Fellowship for research in the Greater Yellowstone The Grand Teton Association offers a graduate fellowship of up to \$10,000/project for graduate studies focused on documenting the almost intangible and disappearing aspects of the Greater Yellowstone Ecosystem, including Grand Teton and Yellowstone National Parks, the John D. Rockefeller, Jr., Memorial Parkway, and other public or private lands. Emphasis areas are lesser-known ecosystem elements such as air and water; geologic or other processes; plants, insects, reptiles, or amphibians, fungi; natural soundscapes; and social science related to public understanding of natural resources and their use or management. Graduate students pursuing either a Master's or Doctoral degree are invited to submit proposals on the application form by February 9, 2018. [Evison Fellowship Call and Application Form](#)

Rocky Mountains CESU Science Partners Publish Information on the Future of Western Forests Under Climate Change and Increased Wildfire

Collaborators from RM-CESU partners, Colorado State University, University of Idaho, University of Montana and University of Colorado Boulder (along with The Nature Conservancy and University of Washington) prepared a journal article for *Ecology Letters*, which has been excerpted in a number of press releases on the topic of "Evidence for declining forest resilience to wildfires under climate change". Funding was provided by another RM CESU partner, the USDA-FS Rocky Mountain Research Station, and included data collected in Colorado, Wyoming, Washington, Idaho and Montana.

The topic of the article is one relevant throughout western North America, focusing on forest ecology under climate change and increased wildfires. Given that climate change can lead to more fires and longer droughts, researchers have wondered how forests are coping. To find out, ecologist Camille Stevens-Rumann of Colorado State University and colleagues studied about 1500 sites in the conifer forests of the U.S.



Helen H. Richardson/The Denver Post via Getty Images

Rocky Mountains that had seen 52 wildfires between 1988 and 2011. The areas spanned elevations from about 700 to 2800 meters above sea level and comprised various types of dry and wet pine forests. The researchers collected seeds from the sites between 2010 and 2014, and, along with previously published data, analyzed the plots' seedling presence and density. By comparing these data to the seedlings in sites that had not burned, they determined the ability of forests to regenerate.

They found a dramatic difference in tree regeneration after fires late last century compared with fires earlier this century. The proportion of sites with no regrowth almost doubled after 2000, from 19% to 32%, coinciding with increasing temperatures and more drought. Forests in the hottest and driest regions were most susceptible. So fires in these areas may cause landscapes and ecosystems to change, for example, from forests to grasslands or shrubs.

But, not all forests are in danger of dying out completely. As Stevens-Rumann acknowledges, the time span she and colleagues studied, 23 years, is very short compared with the life span of a forest. "Even among our sites, some of the forests we studied are regenerating very well," she says. Although some forests may grow back, she says, at the very least we can say that it is going to take much longer that it once did.

The full citation to this journal article is: Stevens-Rumann, C. S., Kemp, K. B., Higuera, P. E., Harvey, B. J., Rother, M. T., Donato, D. C., Morgan, P. and Veblen, T. T. (2017), Evidence for declining forest resilience to wildfires under climate change. *Ecol Lett*. doi:10.1111/ele.12889

Rocky Mountains Cooperative Ecosystem Studies Unit Research at University of Montana and Colorado State University Demonstrates Effects of Arctic Climate Change on Musk Oxen

In 2012 the National Park Service, Shared Beringian Heritage Program, began a collaboration between U.S. and Russian researchers in the Arctic, with a project named: *Trans-Beringia Muskoxen — Creation of Ecological Baselines in an Era of Arctic Warming*. The U.S. principal investigator was Dr. Joel Berger, who has worked on



Musk oxen, massive mammals that live on Arctic tundra, are seeing their numbers dwindle as warmer, rainier winters limit access to food, researchers report. Joel Berger

this project while affiliated with the University of Montana, Colorado State University and the Wildlife Conservation Society.

The cooperators had the objective of establishing baseline conditions for musk oxen within and between populations over time across both the Chukotka and Alaskan Beringian landscapes. Study areas included the Bering Land Bridge National Preserve in western Alaska, and Wrangel Island Zapovednik in Russia. The projects goals were: 1) to gain insights about how climate and other factors affect population change and potential persistence in musk oxen, and 2) to establish ecological baselines.

Dr. Berger and colleagues have now studied musk oxen in Beringia for nearly a decade, and in a January 2018 article published in the journal *Scientific Reports*, they document a disturbing finding that musk oxen are especially vulnerable to rapid climate change in the Arctic, related to rain on snow events and winter storm surges.

In a warming landscape, pregnant female musk oxen may struggle to find enough food for their unborn calves, the researchers found. Their undersized offspring may die young or fail to produce many calves of their own. In places, musk oxen may disappear altogether. The study is the first to suggest a strong link between increasing winter rainfall and the declining health of Arctic mammals. During these studies the investigators also documented loss of musk oxen herds due to winter tsunamis tidal surges along their coastal habitats.



Dr. Berger and his colleagues measured musk oxen with lasers to determine how they were growing. Joel Berger

This open access journal article may be found at:

J. Berger, C. Hartway, A. Gruzdev & M. Johnson, Climate Degradation and Extreme Icing Events Constrain Life in Cold-Adapted Mammals, *Scientific Reports* (2018) 8:1156 DOI:10.1038/s41598-018-19416-9

Archaeological Research in Yellowstone National Park

Since 2007, the University of Montana - Department of Anthropology has conducted archaeological research in Yellowstone National Park (through the Rocky Mountains CESU). Working with archaeologists from the park, **UM's Professor Doug Macdonald** leads the effort to understand the Native American history and prehistory of Yellowstone. Much of this research is now available in the book, ***Before Yellowstone: Native American Archaeology in the National Park***, published in February 2018 by University of Washington Press. **[YELL Archaeological Research](#)**

[PARTNER NEWS:](#)

[Montana State University: MSU professor focuses camera on vanishing glaciers](#) Montana State University photography professor Ian van Coller's efforts to shine a light on climate change have resulted in a series of art books documenting diminishing glaciers, including one that is on exhibit at New York City's Metropolitan Museum of Art.

Van Coller is one of three authors who collaborated to create "**[The Last Glacier](#)**," which is on display at the museum's Robert Wood Johnson Jr. Gallery through Feb. 5. The book, which is 25 inches by 40 inches when open, is composed of 13 woodcuts and 10 photographs that document the melting of glaciers in Glacier National Park. In addition to van Coller, other collaborators include Todd Anderson, a printmaking professor at Clemson University, and Bruce Crownover, a master printer at Tandem Press at the University of Wisconsin-Madison.

"To have (the book) selected for display is really huge for us," van Coller said. He said that The Met, which has two million prints and photographs in its collection and just 300 of those on display at any one time for its thousands of daily visitors, is a large and prestigious audience for the book's message about the impacts of climate change.

[Colorado State University: CSU launches first-of-its-kind certificate in adventure tourism](#) The adventure and outdoor recreation industry is an economic powerhouse in the United States, with consumers spending \$887 billion annually and a workforce of 7.6 million people. To help better prepare people to work in the industry, and improve the skills of those already employed, Colorado State University has launched an **[Online Graduate Certificate in Adventure Tourism](#)**.

[CALENDAR:](#)

March 26-30, 2018: [83rd North American Wildlife and Natural Resources Conference](#), Norfolk, VA. [83rd conference Website](#)

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](#)**.

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. [Tracking the Human Footprint](#)

FUDNING OPPORTUNITIES

The U.S. Geological Survey (USGS) released an RFP for the [Water Resources Research National Competitive Grants Program](#). Each year, the USGS has \$750,000 to \$1,000,000 to support these grants funded through the state Water Centers (National Institutes for Water Resources). Successful proposals go after issues of national concern, team up with USGS scientists, and help to train the next generation of water resource scientists.

In 2017, USGS received 153 pre-proposals, invited 30 for full proposals and funded 3 proposals. There is a pre-proposal process again this year; pre-proposals are due to the Montana Water Center on February 15th (see https://water.usgs.gov/wrri/FY_2018_RFP_104g.pdf). The national-level panel will then select 30 PIs to move forward for full proposals, for grants up to \$250K.

STUDENT OPPORTUNITIES

The [Conservation Leadership through Learning \(CLTL\) Program](#) at Colorado State University (CSU) is an 18-month innovative Master's degree which prepares leaders to address conservation issues around the globe. The program is built around principles of experiential learning, inter-disciplinary instruction, and applied approaches. Our students work closely with a network of practitioners and organizations throughout the program. CLTL is a great option for individuals seeking to make a difference in the lives and ecosystems of our planet. Application for Fall 2018 open until March 1, 2018.

Student Congress on Public Policy for Land Management' Seeks Applicants Young people chosen to participate in this year's Congress in Baker City, Oregon, August 22-25, 2018, receive full travel scholarships and collectively develop recommendations for Secretary Zinke on issues such as: the effects of multiple uses on special designations, and how designation affects future uses, ways to raise public awareness, the role of rivers and trails in settling the United States, and the social and economic effects of public land designations on local communities. This biennial event offered by the Public Lands Foundation and the Bureau of Land Management seeks perspectives from a younger generation and to increase the hiring pool for land management and advocacy jobs.

Applications require a short (less than 3 pages) essay describing an interest in natural resources and/or public lands, and a letter of recommendation from a current or former professor. Submit materials to Mike Ferguson via email at mferguson@publicland.org by March 15, 2018.

TRAINING OPPORTUNITIES

The National Park Service's 2018 workshop on archaeological prospection techniques entitled *Current Archeological Prospection Advances for Non-destructive Investigations of the Marksville Prehistoric Indian Site (16AV1), Louisiana*, will be held **May 21--15, 2018**, at the Marksville State Historic Site in Avoyelles Parish, Louisiana. Lodging will be at the Paragon Casino Resort in Marksville, Louisiana. The lectures will be at a meeting room in the Paragon Casino Resort. The field exercises will take place at the Marksville Prehistoric Indian

Site at the Marksville Sate Historic Site. The site is the type site for the Marksville Culture, a local variant of the Hopewell Tradition. The site contains numerous earthworks built by the indigenous prehistoric people of the southeastern North America. Co-sponsors for the workshop include the National Park Service's Midwest Archeological Center and the National Center for Preservation Technology and Training, as well as the Marksville State Historic Site and the Office of Cultural Development, Division of Archaeology of the Louisiana State Historic Preservation Office. This will be the twenty-eighth year of the workshop dedicated to the use of geophysical, aerial photography, and other remote sensing methods as they apply to the identification, evaluation, conservation, and protection of archaeological resources across this Nation. The workshop will present lectures on the theory of operation, methodology, processing, and interpretation with on-hands use of the equipment in the field. There is a registration charge of \$475.00. Application forms are available on the [Midwest Archeological Center's web page](#). Payment will be made by credit card through the [Friends of NCPTT](#). For further information, please contact Steven L. DeVore, Archeologist, National Park Service, Midwest Archeological Center, Federal Building, Room 474, 100 Centennial Mall North, Lincoln, Nebraska 68508-3873; (402) 437-5392, ext. 141; email: steve_de_vore@nps.gov.

JOB OPPORTUNITIES

For details, visit [Job Opportunities](#)

Research Associate, Center for Colorado River Studies, Utah State University, Logan, UT (review date 3/1/2018)

Post-Doctoral Fellow, Utah Water Research Lab, Utah State University, Logan, UT (review date 2/28/2018)

Forester, College of Natural Resources, University of Idaho, Moscow, ID (review date 2/28/2018)

Natural Resources Outreach Coordinator, Washington State University Extension, position based in Everett, WA (closes 2/19/2018)

Lab Technician, Biochemistry Core Facility, Soil and Water Systems, University of Idaho, Moscow, ID (review date 2/16/2018)

Habitat Analyst, Department of Watershed Sciences, Utah State University, Logan, UT (review date 2/14/2018)

Assistant Professor - Knobloch Professorship in Migration Ecology and Conservation, University of Wyoming, Laramie, WY (review date 2/8/2018)

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.