Rocky Mountains Cooperative Ecosystem Studies Unit

NEWSLETTER
Summer 2020

RM-CESU NEWS & EVENTS

New Dean of the University of Montana, College of Forestry and Conservation Will Chair the RM-CESU: In June 2020 the University of Montana, W.A. Franke College of Forestry and Conservation announced the selection of Dr. Alan Townsend, as the new dean. He will take over this responsibility, along with the chairmanship of the Rocky Mountain CESU, in early October 2020.

Alan is an ecosystem ecologist who previously led distinguished programs at Duke University, the University of Colorado Boulder and Colorado College. At CU Boulder he also was a Research Fellow in the Institute of Arctic and Alpine Research and professor of environmental studies. Originally from Missoula, Townsend has studied how ecosystems work, how they change and what those changes might mean for society. His internationally prominent research includes work on nutrient cycling and biogeochemistry in tropical forests, as well as global-scale analyses of human impact on major element cycles.

Please join us in welcoming Alan to the RM-CESU.

New RM-CESU Partner Representative Named by Boise State University: It is with regret that we announce that Dr. Pei-Lin Yu will be departing Boise State for new opportunities. However, she has recruited an enthusiastic successor to guide Boise State's participation in the Rocky Mountains CESU, Bob H. Reinhardt. He is an Assistant Professor in the Department of History at Boise State University, where he works in the fields of environmental history, public history, the history of the American West, and the history of public health. His most recent book is "Struggle on the North Santiam: Power and Community on the Margins of the American West" (Oregon State University Press, 2020), a detailed interpretive history of a group of Oregon communities that have sought to transition their economies from natural-resource extraction to natural-resource-based recreational tourism. Bob's current project is "The Atlas of Drowned Towns", a comprehensive public history project exploring the lost histories of communities that were inundated, displaced, and disappeared by river development projects in the American West. He is also the author of "The End of a Global Pox: America and the Eradication of Smallpox in the Cold War Era" (University of North Carolina Press, 2015). Bob directs the internship program for Boise State's Department of History, and he is the founder and director of Boise State's Working History Center, which seeks to advocate for and demonstrate the vitality and relevance of history. His professional experience includes serving as the Executive Director of the Willamette Heritage Center (a regional history museum in Salem, Oregon), a postdoctoral fellowship at Carnegie Mellon University, and teaching positions at Western Oregon University and Willamette University. For more information about Bob's experience and

scholarship, see the following web sites: Public History, Environmental History, History of the American West, History of Public Health Internship Coordinator - https://www.boisestate.edu/history/internship-program/; Founder and Director, Working History Center - https://www.boisestate.edu/working-history-center and Department of History — https://www.boisestate.edu/history/

Thanks and good wishes to Pei-Lin Yu and a hearty welcome to Bob Reinhardt.

Glacier and Waterton Lakes NPs Will Hold a Virtual Science and History Week, with On-Line presentations, September 21-24, 2020: Waterton-Glacier International Peace Park will host the first Science and History Week virtual speaker series on September 21-24. Topics include land restoration, wildlife research, and historical park figures. All virtual events are free and open to the public. Participants can register for each of the four presentations by going to the weblink: https://www.nps.gov/rlc/crown/science_history_week.htm
Parks Canada and the National Park Service have jointly hosted an annual Science and History Day since 2004. This year, live webinars replace in-person events due to the ongoing COVID-19 pandemic and travel restrictions. The Science and History Week virtual presentation schedule is detailed below. All presentations occur from noon to 12:45 p.m., Mountain Daylight Time.

Monday, September 21
Restoring Native Fescue Prairie Using Fire and TEK (Traditional Ecological Knowledge) in Waterton Lakes National Park and the Blood Timber Limit
Dr. Cristina Eisenberg, Graduate Faculty, Oregon State University
Kansie Fox, Ecologist Natural Resources Senior Manager, Blood Tribe Land Department
Monroe Fox, Technician, Blood Tribe Land Department

Tuesday, September 22
Raptors on the Move: Glacier National Park
Lisa Bate, Wildlife Biologist, Glacier National Park

Wednesday, September 23
A Trip Through Time with the Mountain Legacy Project's Repeat Photography Collection in Waterton Lakes National Park
Cassandra Buunk, MA Candidate, School of Environmental Studies, University of Victoria

Thursday, September 24
Revisiting Josephine Doody: Bootlegging in Glacier National Park
Kelli Casias, Historical archaeologist, Western Cultural; and PhD candidate, University of Montana

***RM-CESU Partners Publish Important Work on Alpine Meltwater Biodiversity with Climate Change*:**
Researchers have long predicted that the shrinkage and disappearance of glaciers will reduce biodiversity in mountain ecosystems as species that live in habitats influenced by glacier meltwater are lost. However, a new study published in the *Proceedings of the National Academy of Sciences* shows that a specialized community of cold-water invertebrates (including the endangered meltwater stonefly) has persisted in the high-elevation streams of Glacier National Park, even in areas deglaciated since the Little Ice Age, nearly 170 years ago.

The study was led by Clint Muhlfeld, a U.S. Geological Survey research ecologist and associate research professor at the University of Montana's Flathead Lake Biological Station. Other researchers who contributed to the research include other scientists from the USGS – Northern Rocky Mountain Science Center, University of Montana, University of Copenhagen and Washington State University. The analysis included the use of high-resolution glacier retreat data from 1850 through 2015 in Glacier National Park, along with stream community data from 129 sites in the Park. The study projects a 70% to 80% decline in suitable habitat by the end of the century, but not necessarily loss of this community, with the complete disappearance of glaciers. The high-elevation streams should continue to serve as refugia for invertebrate species. The study is online at https://www.pnas.org/content/early/2020/05/12/2001697117 The paper citation is: C. Muhlfeld, T. Cline, J. Giersch, E. Pietzsch, C. Florentine, D. Jacobsen, and S. Hotaling, 2020, PNAS, Vol 117 (22) 12208-12214; https://doi.org/10.1073/pnas.2001697117

A view of Going-to-the-Sun Mountain through melting snow and ice at the origin of Reynolds Creek near Logan Pass in Glacier National Park, Montana. (Credit: Joe Giersch, USGS)

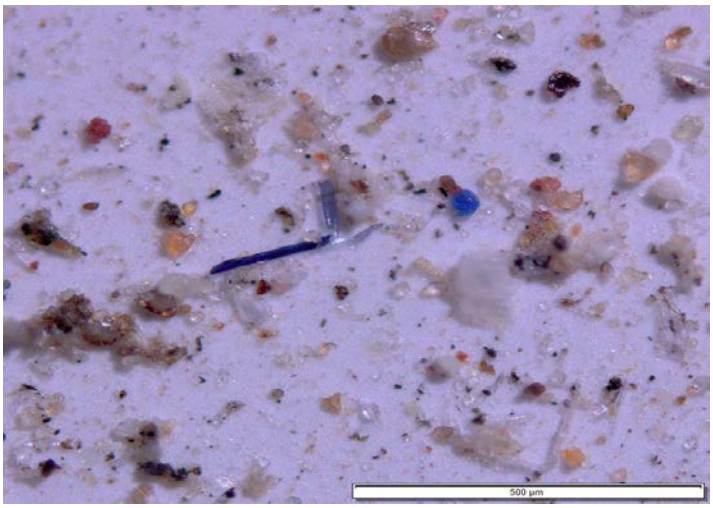
ROMO Research Conference Highlights Work of RM-CESU Researchers and Students: Researchers and students from RM-CESU partners: Colorado State University, University of Wyoming, USGS, University of Northern Colorado, Utah State University, University of Colorado Boulder, Washington State University, Montana State University, Metropolitan State University of Denver, USDA Forest Service, National Park Service, presented their research results at the 2020 Rocky Mountain National Park Research Conference. This Conference, held on March 10-11, 2020 in Estes Park, Colorado, was hosted by ROMO's Continental Divide Research Learning Center, with support from the Rocky Mountain Conservancy. The Keynote Lecture was delivered by David Cooper, Colorado State University, who is one of the "power users" of the RM-CESU agreement. He discussed the need for collaborative field research to conserve and restore wetland and riparian communities in the Rocky Mountains.

Dr. Chris Ray, CU Boulder, Receives Award at the ROMO Research Conference, March 10, 2020. Presenters included Superintendent Darla Sidles (right) and Chief of Resource Stewardship and Science Koren Nydick (left). Photo Credit, Ann Schonlau, Volunteer, Rocky Mountain NP

Special Awards were presented at the conference, including the "Stewardship Award" to Dr. Chris Ray, University of Colorado Boulder, for her work on the American pika and the species response to climate change. The "Pikas in Peril" project, funded by the NPS-Climate Change Program, was facilitated through the RM-CESU agreement.

During concurrent oral sessions and poster sessions, researchers discussed research on natural resources, cultural resources and social science. At the end of Day 2 of the Conference, the ROMO Management Team discussed "Challenges and Opportunities in Management Amid Changes". For more information, see the Conference Proceedings booklet at: https://www.nps.gov/rlc/continentaldivide/upload/2020-RMNP-Research-Conference_Proceedings_508.pdf

RM-CESU Partners at Utah State University Publish Research Results on Plastics in Rain and Dryfall: One of our RM-CESU partners made the news recently when they published a paper in the journal *Science* describing their finding plastic in remote parts of the United States; the researchers collected wet and dry fall samples from 11 national parks and wilderness areas. The lead author of the paper, Dr. Janice Brahney, was also invited to write on Op-Ed piece for the New York Times in late June 2020, based on the findings in the paper.



Microscope image of microplastics in atmospheric particulate samples. (Photo credit: Janice Brahney, Utah State University)

The researchers, including a student at USU, found tiny bits of plastic in 98 percent of the 339 samples they collected; plastics accounted for 4 percent of the dust particles that were tested. Dr. Brahney and co-authors Margaret Hallerud and Eric Heim of Utah State, Maura Hahnenberger of Salt Lake Community College and Suja Sukumaran of Thermo Fisher Scientific, determined the probable origins of the particles. Larger particles came down with rain and snow, while smaller ones showed up under dry conditions. Dr. Brahney noted that this airborne pollution could contribute to environmental disruption of microbial communities and cause broader ecological damage. "This ubiquity of microplastics in the atmosphere and the subsequent deposition to remote terrestrial and aquatic environments raise widespread ecological and societal concerns," Brahney said.

To view the USU press release, go to https://www.usu.edu/today/story/more-than-1000-tons-of-plastic-rains-into-western-us-protected-lands-annually . The research was supported by the Utah Agricultural Experiment Station, the National Science Foundation and a USDA Forest Service agreement.

The citation for the paper is: Brahney, Janice, Margaret Hallerud, Eric Heim, Maura Hahnenberger, Suja Sukumaran. "Plastic Rain in Protected Areas of the United States," Science, 12 June 2020 DOI: 10.1126/science.aaz5819

Keck Foundation Grant to a Number of RM-CESU Partners will Investigate Subsurface Microbes in Yellowstone Thermal Pools: A prestigious $1 million grant from the W.M. Keck Foundation will help a team of researchers led by Eric Boyd, Department of Microbiology and Immunology, Montana State University answer questions about microbial life in the subsurface of Yellowstone National Park, including its extent and processes that allow it to thrive.

The Keck grant will support three years of research by Boyd's interdisciplinary team and fund the design and construction of a specialized instrument triggered by earthquakes to collect samples from deep within existing boreholes. The research will bridge the gap between biology and geology to determine how Earth's natural processes influence microbial life.

The project is based at MSU-Bozeman, but includes researchers from Princeton University, the University of Colorado, New Mexico Institute of Mining and Technology, the United States Geological Survey, the National Park Service, Salish Kootenai College, Diné College and the private engineering firm Class VI Solutions. Much of the funding will support graduate research positions and summer research internships for undergraduate Native American Indian students.

For more information go to:
http://wmkeck.org/images/stories/pdfs/pdfs/SE_Abstracts_D19.pdf

http://www.wmkeck.org/grant-programs/research/medical-research-grant-abstracts/science-and-engineering-2019

https://www.montana.edu/news/19586/eric-boyd-awarded-1m-keck-foundation-grant-to-link-seismic-activity-with-microbial-activity-in-yellowstone