FY2014 Annual Report
Cooperative Ecosystem Studies Units (CESU) Network is a national consortium of federal agencies, academic institutions, and other partners, organized around biogeographic areas. The CESUs were established to provide research, technical assistance, and education to federal resource and environmental managers. The Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU) is one of 17 units in the CESU National Network.

The Rocky Mountains Cooperative Ecosystem Studies Unit has been operating for fifteen years. In 1999, the RM-CESU was one of four pilot CESUs established through a competitive process. It was then a partnership of four Federal agencies and 6 universities. The partnership has grown today to 9 Agencies and 20 Non-Federal members. Members of the RM-CESU are the following:

- University of Montana-host 1999
- University of Idaho 1999
- Montana State University 1999
- Salish Kootenai College 1999
- Utah State University 1999
- Washington State University 1999
- University of Wyoming 2002
- Colorado State University 2004
- University of Colorado Boulder 2002
- University of Colorado Denver 2002
- University of Northern Colorado 2006
- University of Calgary 2007
- Metropolitan State University of Denver 2011
- Little Big Horn College 2012
- Northwest College 2013
- University of Utah 2013
- Chief Dull Knife College 2014
- Blackfeet Community College 2014
- University of Waterloo 2014
- Wildlife Conservation Society 2014

USDI
- Bureau of Land Management 1999
- Bureau of Reclamation 2004
- Fish and Wildlife Service 2009
- Geological Survey 1999
- National Park Service 1999

USDA
- Forest Service 1999
- Natural Resources Conservation Service 2004

DOD
- US Army Corps of Engineer-Civil Works 2008
- Office of Deputy Under Secretary of Defense (Installations and Environment) 2009

Mission

The mission of the Rocky Mountains Cooperative Ecosystem Studies Unit is to improve and disseminate the knowledge base for managing natural and cultural resources in the rapidly changing social, cultural, and environmental landscape of the Rocky Mountain Region, and to extend its expertise to national issues where appropriate.
**RM-CESU PROJECTS ACTIVITY FOR FY2014**
This year, the RM-CESU facilitated 216 task agreements (TAs) obligating $22,423,521 to new projects ($9,725,488/135 TAs) and adding funds to existing projects ($12,698,033/81 TAs). A complete listing of projects may be found on the RM-CESU Project List for FY14 on the web site at [http://www.cfc.umt.edu/cesu/Projects/default.php](http://www.cfc.umt.edu/cesu/Projects/default.php) (look under **Annual Reports**). RM-CESU projects provide needed research, technical assistance, and/or education to our Federal partners and cover the fields of natural resources, cultural resources, social sciences, and interdisciplinary fields.

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**Project Spotlight:** Trans-Beringia Muskoxen — Creation of Ecological Baselines in an Era of Arctic Warming

**Function:** Research  
**Agency:** National Park Service  
**PI:** Joel Berger, University of Montana  
**Discipline:** Natural  
**Funding:** $106,549 [FY12-14]

Joel Berger, the John J. Craighead Chair and Professor of Wildlife Conservation at the University of Montana, is leading a strong collaborative effort with Russian and American partners to establish baseline conditions for muskoxen in both the Chukotka and Alaskan Beringian landscapes. The projects goals are: 1) to gain insights about how climate and other factors affect population change and potential persistence in muskoxen, and 2) to establish ecological baselines. This will be achieved through comparative efforts to understand populations in Chukotka (e.g. Wrangel Island in Russia) and eastern Beringia (NPS units). Joel blogs about his research trip to Wrangel Island this past spring. Read his three blog posts here:

[http://e360.yale.edu/digest/on_far-flung_wrangel_island_aScientist_sizes_up_muskoxen/4121/](http://e360.yale.edu/digest/on_far-flung_wrangel_island_aScientist_sizes_up_muskoxen/4121/)  
[http://e360.yale.edu/digest/studying_a_polarMenagerie_on_an_island_in_arctic_russia/4126/](http://e360.yale.edu/digest/studying_a_polarMenagerie_on_an_island_in_arctic_russia/4126/)  
[http://e360.yale.edu/digest/russianamericanCollaboration_carries_on_in_key_arctic_ecosystem/4137/](http://e360.yale.edu/digest/russianamericanCollaboration_carries_on_in_key_arctic_ecosystem/4137/)
RM-CESU Activity by Agency Partners for FY2014

<table>
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<th># of Task Agreements</th>
<th>Total Funding</th>
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<td>USGS</td>
<td>$1,880,344</td>
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<td>USACE-CW</td>
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<td>USFS</td>
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</table>

**Trends and Observations:**

- Eight of the nine Agencies facilitated task agreements through the CESU this fiscal year. NPS, both in terms of number of projects and $ amount, and DoD, in terms of $ amount, are the biggest users of the CESU.
- RM-CESU facilitated $7 million in cultural, social and interdisciplinary projects in FY14. DoD alone funded $2.1 million towards cultural resource projects on military lands and NPS obligated $771,364 on cultural projects in parks.
- BLM increased its use to the CESU agreement this year in terms of $ amount ($715,302 over FY13) to facilitate projects ranging from biological weed control research to an archeological inventory of the Nez Perce National Historic Trail.
- Although number of agreements stayed steady for NPS in FY14, total $ are down over FY13 by $1.3 million.
RM-CESU Activity by Non-Federal Partners for FY2014
Sixteen of the twenty RM-CESU non-federal members received at least one project this year.

Two of the newest members each had a project this year: University of Waterloo with USGS ($20,000 – identifying priority areas for the preservation and restoration of sage grouse) and the Wildlife Conservation Society with NPS ($100,500 – restoring and facilitating the stewardship of wildlife and habitats and improving the public’s understanding of protected areas).

Colorado State University (CSU) remains the largest user of the CESU. CSU received $16.2 million in 91 task agreements with Bureau of Management, Department of Defense, National Park Service, US Fish and Wildlife Service and Geological Survey. CSU’s Center for Environmental Management of Military Lands (CEMML) alone was the recipient of $8.6 million in 30 task agreements from the DoD. CEMML provides research and sustainable management of natural and cultural resources on federal lands.
Three university partners, University of Colorado Boulder, University of Montana, and University of Wyoming, all received over a million dollars in project funding. Washington State University significantly increased its RM-CESU activity (6 TAs; $246,395) this year (0 in FY13). The NPS Visitor Services Project (VSP) formerly housed at the University of Idaho is now located in the Social and Economic Sciences Research Center at Washington State University. VSP’s principal investigator, Lena Le, has four new projects this year with George Washington Carver National Monument, Chickamauga and Chattanooga National Military Park, Fort Monroe National Monument, and Katmai National Park.

Smallest Task Agreement: $1,647 NPS/University of Wyoming; PI: Steve Smukto; GYCC Public Meeting Planning

Largest Task Agreement: $ 2,239,600 DoD/Colorado State University; PI: Robert Brozka; Natural Resources Ecosystem Management Activities at Pohakuloa Training Area and Keamoku Land Parcel Management Area Activities for the U. S. Army


To learn more about all the projects receiving funding in FY14, view the Project Summary Sheets at http://www.cfc.umt.edu/cesu/Projects/Agency_reports.php; click on “Agency” and then “Year”
Forty-four principal investigators receiving project funds in FY14 were using the RM-CESU agreement for the first time and contributed $3,082,031 to RM-CESU totals.

**Colorado State University (11):** Michael Antolin (Biology), Randall Boone (Natural Resource Ecology Laboratory), Joseph Champ (Journalism and Technical Communication), Scott Denning (Education), Paul Evangelista (Natural Resource Ecology Laboratory), Lee Grunau (Colorado Natural Heritage Program), Jayne Jonas-Bratten (Forest & Rangeland Stewardship), Stephanie Kampf (Ecosystem Science and Sustainability), Sunil Kumar (Natural Resource Ecology Laboratory), Susan Spackman Panjabi (Colorado Natural Heritage Program), Leroy Poff (Biology)

**University of Colorado Boulder (10):** Jullian Allaz (Geological Sciences), Katherine Anderson (Arctic and Alpine Research), Kristen Carpenter (American Indian Law Program), Thomas Hauser (Engineering), Fred Luiszer (Environmental and Geological Sciences), Christy McCain (Natural History Museum), John Pitlick (Geography), Keith Porter (Structural Engineering and Structural Mechanics), Seth Spielman (Geography)

**University of Colorado Denver (1):** Apostol Panayotov (Geomatics Engineering)

**Montana State University (7):** Dennis Aig (Science and Natural History Filmmaking), Kevin Amende (Mechanical & Industrial Engineering), Eric Boyd (Thermal Biology Institute), Laura Burkle (Ecology), Andrea Litt (Ecology), Diane Smith (History and Philosophy)

**Northwest College (1):** Chris Finley (Anthropology)

**University of Idaho (1):** Patrick Wilson (Natural Resource Policy)

**University of Montana (3):** Kelsey Jensco (Watershed Hydrology), Andrew Larson (Forest Management), Libby Metcalf (Parks, Tourism & Recreation Management)

**Utah State University (3):** Hatim Geli (Civil and Environmental Engineering), Jim Lutz (Wildland Resources), Daniel MacNulty (Wildland Resources)

**University of Utah (1):** Phoebe McNeally (Geography)

**University of Waterloo (1):** Bradly Fedy (Environment and Resource Studies)

**Wildlife Conservation Society (1):** Shannon Roberts

**Washington State University (1):** Brett Oppegaard (Creative Media and Digital Culture)

**University of Wyoming (3):** Nicholas Graff, Steve Smutko (Collaborative Practice), John Tanaka

**Student Participation:** The majority of all RM-CESU project (and nearly 70 % of RM-CESU National Park Service projects) have student participation. Student participation includes research work by graduate and undergraduate students, as well as internships, field schools and class participation in projects.
Student Spotlight: From the Melting Ice: Assembling the Paleobiological Specimens from Ice Patches in the Greater Yellowstone Area – Meghan J Forney – Montana State University

The Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU) not only provides research opportunities to university scholars but also to their students, giving them a unique chance to be a part of exciting research as well as establish lasting connections to those in government agencies. The survey of Greater Yellowstone Area ice patches, led by Dr. Craig M. Lee (Institute of Alpine and Arctic Research) and funded in part by RM-CESU, is one such project that has afforded this experience to students at Montana State University. Dr. Lee’s archaeological survey of ice patches in the Greater Yellowstone Ecosystem identified numerous paleobiological specimens, in addition to cultural artifacts, rapidly melting from the alpine ice. To date, most of these have been macro-specimens: either paleobotanical samples such as tree roots or branches (Figure 1) or paleozoological samples consisting largely of faunal remains of bison and bighorn sheep. Such samples have the potential to reveal much about the past environment of the Northern Rocky Mountains, including how the alpine has been impacted by climate change in the past and understanding how Native Americans in the past flourished in these areas now considered marginal for humans.

Because ice patch research has been largely conducted by archaeologists, paleobiological specimens have taken a backseat to the recovery and analysis of artifacts. However, scientists are now beginning to reverse this trend. The first step to correcting this has been the creation of a specimen catalog, which can be used to generate a map that identifies sample locations. This map can not only help to direct future research but can assist federal agencies in identifying areas that need active management in their jurisdictions. As more scholars and federal agencies become aware of paleobiological samples at ice patches and their potential for alpine paleoenvironmental reconstruction, we hope they will receive the same attention as ice patch artifacts before they too are exposed to the elements from the melting ice and disappear.

Figure 1. An exposed tree root system disintegrates as the ice patch that preserved it retreats. (Photo by Meghan J. Forney)

Meghan Forney is the recipient of the 2014 RM-CESU Student Award (see page 11)
RM-CESU ACTIVITY FY10-FY14
In last five years of operation, the RM-CESU has facilitated 1,100 Task Agreements obligating 104.3 million dollars to non-federal partners for project work. There are approximately 400 active projects between RM-CESU agency and non-federal partners.

<table>
<thead>
<tr>
<th>Year</th>
<th># of Task Agreements</th>
<th>Funds obligated (in $ millions)</th>
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<td>243</td>
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<td>2012</td>
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<td>2013</td>
<td>192</td>
<td>20.6</td>
</tr>
<tr>
<td>2014</td>
<td>216</td>
<td>22.4</td>
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</table>

RM-CESU HIGHLIGHTS & ACCOMPLISHMENTS

❖ **New Members (effective date 2/20/2104):** From a widely respected conservation organization to notable Canadian university to two Montana tribal colleges. The new members offer unique additional potential to the RM-CESU.

- Blackfeet Community College: [http://bfcc.edu/](http://bfcc.edu/)
- Chief Dull Knife College: [http://www.cdkc.edu/](http://www.cdkc.edu/)
- University of Waterloo: [https://uwaterloo.ca/](https://uwaterloo.ca/)

❖ **Two RM-CESU Students Awarded Jerry O'Neal Fellowship for Research in Glacier National Park** The Jerry O’Neal fellowships, funded through the Crown of the Continent Research Learning Center at Glacier National Park, were announced for student work in summer 2014. This student award supports research in Glacier National Park, Grant-Kohrs Ranch National Historic Site, and Little Bighorn Battlefield National Monument. The competition is facilitated through the Rocky Mountains CESU and is open to students at all the RM-CESU partner universities.

This year’s Fellowship awardees are:

Wesley's study will help gain an understanding of how mountain goats are affected by roads, people and predators, and adjacent trails. Study goals include: i) assess how goats use roads and adjacent trails, ii) map the intensity of interactions with people, and iii) develop baseline data on effects of roads, adjacent trails and people on goat distribution and behavior. Knowing more about the direct and indirect consequences of the interactions between goats and people will help park managers plan for multiple uses along the Going-to-the-Sun Road in Glacier NP.

➢ **Sarah Moody, M.A. Candidate – Environmental Studies, University of Montana: Communicating to the Public: Climate Change in Glacier National Park**

Sarah will produce 2-3 short videos to educate the public on impacts of climate change on Glacier National Park. Potential topics for the videos include: how the melting glaciers affect watershed function, the effects of climate change on selected wildlife species, and how the Park Service is responding to climate change by adapting their management actions. Sarah will use the videos to showcase the landscapes of Glacier NP, and to disseminate facts about climate impacts. These videos will be used to communicate with the public about how Glacier is changing and what they can do to mitigate the effects of climate change.
2014 RM-CESU Student Award The RM-CESU Student Award program was established in 2007 as a way to recognize outstanding accomplishments by students involved in RM-CESU projects.

The recipient of the 2014 Student Award is Meghan Forney, Montana State University. Meghan was nominated for this award by Dr. Craig Lee for her independent undergraduate research project “Assembling Paleobiological Materials from Ice Patches in the Greater Yellowstone Area.”

Dr. Lee went on in his letter of support to note:

Meghan had an aptitude for working with the incredibly fragile and rare organic cultural artifacts and biological specimens exposed by melting ice patches. She worked diligently to catalogue specimens, create a photo archive, sample bone and wood for isotopic analysis, and construct artifact mounts, etc. She then took the initiative to put the paleobiological materials from the Yellowstone CESU project in the context of ice patch discoveries throughout the Greater Yellowstone Ecosystem (GYE). This was a solid contribution to ice patch science. Her project, “Assembling Paleobiological Materials from Ice Patches in the Greater Yellowstone Area,” speaks directly to the “cross boundary” issue of melting snow and ice in the GYE. The synergistic nature of the work helps apprise resource managers of the conservation crisis occurring in this multi-jurisdictional ecosystem.

Meghan, now a graduate student at the University of Oklahoma, presented the results of her project at the RM-CESU Managers Meeting in Salt Lake City. She quite impressed both the Federal managers and university faculty in attendance with her poise, knowledge and desire to continue work in alpine archaeology.

The RM-CESU Wishes a Fine Retirement to Kathy Tonnessen, NPS Natural Resources Research Coordinator It is with regret and thanks that we say farewell to Dr. Kathy Tonnessen, NPS Research Coordinator with the RM-CESU. Kathy, one of the first agency representatives in the CESU Network, has served with the RM-CESU at the University of Montana since 2000.

Kathy excelled in service to the Rocky Mountain parks by sponsoring an annual RM-CESU parks meeting to allow the park resource managers to discuss issues of mutual interest and to allow us to “showcase” RM-CESU university projects in parks.
She has assisted many of the Rocky Mountain parks in finding the best research and technical assistance partners, and in defining their research needs. Managers in the Rocky Mountains parks and throughout the NPS and across the other agencies, consistently praise Kathy and the RM-CESU for “…being an ever-willing source of advice and counsel on research project, potential providers, funding strategies, and more…”

The RM-CESU has been a leader since the inception of the CESU idea and Kathy has been a strong contributor to RM-CESU’s success and national recognition. The RM-CESU with Kathy’s guidance has pioneered new approaches to cooperative work, including joint meetings with other CESUs, student fellowship and internship opportunities, and workshops addressing key issues such wilderness stewardship and climate change. She has also provided leadership through participation in National CESU meetings and forums and served as the national program lead for the NPS CESUs from 2008-10. During Kathy’s tenure with the RM-CESU, it has grown to be the largest CESU in the national system.

This past fall, Kathy was recognized for her exceptional career accomplishments and contributions with a Department of the Interior’s Superior Service Award. As Kathy looks back, the most rewarding aspects of her job were “Working in beautiful and fun locations to protect and preserve these areas. The fact is, the average person cares about our National Parks and wants these resources protected, and so public support is tremendous.”

All of the RM-CESU universities and federal partners were the beneficiaries of Kathy’s leadership, professionalism and enthusiasm for the CESU concept. We celebrate Kathy accomplishments and wish her well in her retirement. She will continue to work with NPS units in her retirement, through the NPS Emeritus Program.
Program and as an affiliate faculty member at The University of Montana, College of Forestry and Conservation.

- **NPS Cultural Resource Specialist, Pei-lin Yu, moves on Boise State University** Dr. Pei-Lin Yu served as the RM-CESU Cultural Resource Specialist with the National Park Service at the University of Montana for almost five years. She took a new position on the faculty of the Department of Anthropology, Boise State University beginning in August 2014. Pei-Lin is an archeologist who served the parks of the Intermountain Region and beyond in getting research and technical assistance done with our RM-CESU partner universities and colleges. While at the RM-CESU she was most influential in putting together a consortium of researchers and outreach specialists from the University of Colorado Boulder, University of Wyoming, Salish Kootenai College, and two tribes (Blackfeet and CSKT) on a climate change project in Glacier National Park. She facilitated a number of archeology field schools in parks of the Rocky Mountains, including field experiences for native students. In her new position she is enjoying teaching large archeology survey courses and specialized graduate seminars. She plans to start field work in 2015 on the archeology and anthropology of peoples of Taiwan. She will continue to work with the RM-CESU by participating in an “outreach” trip to some of our new tribal college partners. And, with any luck, she may be able to convince the folks at Boise State University to join the RM-CESU.

- **RM-CESU Welcomes New NPS Research Coordinator and Science Advisor** Dr. Brendan Moynahan will lead the RM-CESU for the National Park Service from the University of Montana based in Missoula, MT. Brendan comes to us from the USFWS National Bison Range in Montana where he served as a supervisory wildlife biologist. Prior to that Brendan worked for the NPS as the I&M program manager for the Southeast Alaska Network, and for the Bureau of Land Management (BLM) as a wildlife biologist and Presidential Management Fellow. Brendan holds degrees in political science (environmental policy) and ecology and received his Ph.D. in fish and wildlife biology from the University of Montana.