

MtnClim 2018

8th Mountain Climate Conference



Anticipating climate change impacts in mountains: Embracing variability

**at the Rocky Mountain Biological Laboratory (RMBL)
in Gothic, Colorado**

September 17 - 21, 2018

<http://www.rmbll.org/mtn-clim-2018/>

www.mtnclim.org



Group Photo from MtnClim in 2016

Theme for 2018

Anticipating climate change impacts in mountains: Embracing variability.

Decades of research has led to the understanding that temporal variability in climate affects mountain ecosystems in terms of water availability, the distribution of organisms, wildfire, and a myriad of ecosystem processes. In addition to variation over time, there has been increased interest in the variability that we see in mountain climate as expressed in space. We will look at how the intersection of climate variation in time and space might produce surprises that are hard to anticipate. These include the potential for mountain systems to act as refugia, approaches for characterizing spatial and temporal climate variability (e.g. climate velocity), climatic buffering by forests, and other areas of research relevant to anticipating and mitigating climate change impacts

In addition to the main theme on climate variability, MtnClim 2018 will also include sessions on the impact of potentially declining snowpack in mountainous social-ecological systems, with the below three focus areas:

- **Trees, Snow, and Water**
- **Causes and Consequences of Temperature and Hydroclimate Variability during the Common Era**
- **Overview & Follow-up from the Global Climate Action Summit**

Mtn Clim 2018

September 16 - 21, 2018 in Gothic, Colorado

**Meals and Sessions will take place in the
billy barr community center (bbcc)**

**unless otherwise
noted**

Sun Sep 16

Time	Event	Other Location
3:00 PM - 6:00 PM	Registration for early arrivals	bbcc board room
6:00 PM - 7:00 PM	Dinner	

Mon Sep 17

Time	Event	Other Location
7:00 AM - 8:00 AM	Breakfast	
9:00 AM - 5:00 PM	Field Trips near RMBL to research and conservation areas	meet at Visitor Center
3:00 PM - 6:00 PM	Registration in billy barr community center	bbcc board room
6:00 PM - 7:00 PM	Dinner	
7:00 PM - 7:10 PM	Set up for Talk	
7:30 PM - 8:30 PM	Redmond Lecture: Chris Daly	

Tue Sep 18

Time	Event	Other Location
7:00 AM - 7:50 AM	Breakfast	
7:50 AM - 8:00 AM	Set up for Meeting	
8:00 AM - 9:30 AM	Session: Trees and Snow and Water; Chair: Jessica Lundquist	
9:30 AM - 9:50 AM	Break	
9:50 AM - 10:50 AM	Session: Trees and Snow and Water (Continued)	
10:50 AM - 11:50 AM	Session: Causes and Consequences of Temperature and Hydroclimate Variability during the Common Era; Chairs: Connie Woodhouse, Gregory Pederson	
11:50 AM - 12:00 PM	Set up for Lunch	
12:00 PM - 1:00 PM	Lunch	
1:00 PM - 1:10 PM	Set up for Meeting	
1:10 PM - 2:40 PM	Session: Causes and Consequences of Temperature and Hydroclimate Variability during the Common Era (Continued)	
2:40 PM - 3:00 PM	Break	
3:00 PM - 5:30 PM	Session: Contributed Talks; Chair: Connie Millar	
5:50 PM - 6:00 PM	Set up for Dinner	
6:00 PM - 7:00 PM	Dinner	
7:30 PM - 9:30 PM	Poster Session	

Wed Sep 19

Time	Event	
7:00 AM - 7:50 AM	Breakfast	
7:50 AM - 8:00 AM	Set up for Meeting	
8:00 AM - 9:00 AM	Keynote: John Harte	
9:00 AM - 10:00 AM	Anticipating climate change impacts in mountains; Chairs: Solomon Dobrowski and John Abatzoglou	
10:00 AM - 10:20 AM	Break	
10:20 AM - 11:50 PM	Anticipating climate change impacts in mountains (cont)	
11:50 AM - 12:00 PM	Set up for Lunch	
12:00 PM - 1:00 PM	Lunch	
1:00 PM - 1:10 PM	Set up for Meeting	
1:10 PM - 3:00 PM	Workshops/Research Tour; These include instrumentation, iButtons, inside ones like broader impacts, as well as the RMBL showcase including warming experiment	
3:00 PM - 3:15 PM	Group Photo	outside of the bbcc
3:15 PM - 4:15 PM	Early Career Scientists; Chairs: Jia Hu and Meagan Oldfather	
4:15 PM - 4:30 PM	Break	
4:30 PM - 5:30 PM	Early Career Scientists (continued)	
5:50 PM - 6:00 PM	Set up for Dinner	
6:00 PM - 7:00 PM	Dinner	
7:00 PM - 7:10 PM	Set up for Talk	
7:30 PM - 8:30 PM	Keynote: David Inouye	

Thu Sep 20

Time	Event	
7:00 AM - 7:50 AM	Breakfast	
7:50 AM - 8:00 AM	Set up for Meeting	
8:00 AM - 10:00 AM	Session: Contributed Talks; Chair: Charlie Luce	
10:00 AM - 10:20 AM	Break	
10:20 AM - 11:50 PM	Session: Contributed Talks (Continued); Chair: Andy Bunn	
11:50 AM - 12:00 PM	Set up for Lunch	
12:00 PM - 1:00 PM	Lunch	
1:00 PM - 1:10 PM	Set up for Meeting	
1:10 PM - 1:30 PM	Overview & Follow-up from Global Climate Action Summit; Chair: Connie Millar	
1:30 PM - 3:00 PM	Anticipating climate change impacts in mountains (cont); Chairs: Solomon Dobrowski and John Abatzoglou	
3:00 PM - 3:30 PM	Break	

3:30 PM - 5:00 PM Session: Facilitating collaboration in mountain climate science; Chair: Scotty Strachan
5:00 PM - 5:50 PM No Host Happy Hour
5:50 PM - 6:00 PM Set up for Dinner
6:00 PM - 7:00 PM Dinner
7:00 PM - 7:10 PM Set up for Movies
7:15 PM - 8:15 PM MtnClim at the Movies: "End of Snow" film featuring billy barr and "Climb-it Change" by Trevor Bloom

Fri Sep 21

7:00 AM - 7:50 AM Breakfast
7:50 AM - 8:00 AM Set up for Meeting
8:00 AM - 11:50 PM Workshops/Breakouts
11:50 AM - 12:00 PM Set up for Lunch
12:00 PM - 1:00 PM Lunch
1:00 PM MtnClim Adjourns

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(bbcc)

Sunday September 16

Time	Event
3:00 PM - 6:00 PM	Registration for early arivals
6:00 PM - 7:00 PM	Dinner

Monday September 17

Time	Event
7:00 AM - 8:00 AM	Breakfast
9:00 AM - 5:00 PM	Field Trips near RMBL to research and conservation areas
3:00 PM - 6:00 PM	Registration in billy barr community center
6:00 PM - 7:00 PM	Dinner
7:00 PM - 7:10 PM	Set up for Talk
7:30 PM - 8:30 PM	Redmond Lecture: Christopher Daly (Director, PRISM Climate Group, Oregon State University) TEMPERATURE LANDSCAPES IN COMPLEX TERRAIN - SCALING DOWN TO SOMETHING USEFUL

Tuesday September 18

Time	Event
7:00 AM - 7:50 AM	Breakfast
7:50 AM - 8:00 AM	Set up for Meeting
8:00 AM - 9:30 AM	Session: Trees and Snow and Water; Chair: Jessica Lundquist
8:00-8:15	WHAT CAN TREE SWAY TELL US ABOUT SNOW INTERCEPTION?
	Mark Raleigh, University of Colorado, CIRES/NSIDC
8:15-8:30	SNOW DEPTH VARIABILITY AT THE FOREST EDGE IN MULTIPLE CLIMATES
	William Ryan Currier, Department of Civil and Environmental Engineering, University of Washington, Seattle, WA, USA
8:30-8:45	PERSISTENCE AND PLASTICITY IN FOREST WATER USE STRATEGIES FOR GOTHIC-AREA CONIFERS
	Max Berkelhammer, University of Illinois at Chicago
8:45-9:00	HYDROMETEOROLOGICAL CONTROLS ON SOIL NITROGEN AVAILABILITY AND TREE NITROGEN USE IN A SNOW-DOMINATED WESTERN US MONTANE FOREST
	Jia Hu, School of Natural Resources and the Environment, University of Arizona
9:00-9:15	SNOW LOSS, RUNOFF EFFICIENCY AND THRESHOLD HYDROLOGIC RESPONSE IN THE SEMI-ARID WESTERN U.S.
	John C. Hammond, Department of Geosciences, Colorado State University, Fort Collins, CO
9:15-9:30	TREE RING-BASED INSIGHTS ON SNOWPACK VARIABILITY ACROSS THE WESTERN AMERICAN CORDILLERAS
	Bethany Coulthard, Laboratory of Tree Ring Research U. Arizona

9:30 AM - 9:50 AM	Break
9:50 AM - 10:50 AM	Session: Trees and Snow and Water (Continued)
9:50-10:05	EARLY SNOWMELT TIMING LEADS TO DIVERGENT WILDFIRE RESPONSES IN VEGETATED ECOSYSTEMS OF WESTERN USA Donal O'Leary III, University of Maryland, College Park
10:05-10:20	APPLYING HIGH-RESOLUTION MODELING AND OBSERVATIONS OF SNOW-FOREST INTERACTIONS TO IMPROVE WATER MANAGEMENT Adrian Harpold, University of Nevada, Reno
10:20-10:35	HIERARCHY OF FOREST EFFECTS ON SNOW STORAGE UNDER A RANGE OF CLIMATE CONDITIONS Susan E. Dickerson-Lange, Natural Systems Design, Seattle, WA
10:35-10:50	FOREST ECOSYSTEMS AND THE WATER CYCLE ACROSS MULTIPLE SPATIAL SCALES Jessica Lundquist, University of Washington, WA
10:50 AM - 11:50 AM	Session: Causes and Consequences of Temperature and Hydroclimate Variability during the Common Era; Chairs: Connie Woodhouse, Gregory Pederson
10:50-11:10	PERMANENT ICE PATCH RECORDS OF HOLOCENE CLIMATE IN THE BEARTOOTH MOUNTAINS Nathan Chellman, Desert Research Institute; Division of Hydrologic Sciences, Reno, NV
11:10-11:22	RECONSTRUCTING TEMPERATURE AND MOISTURE VARIABILITY IN THE UPPER RANGES OF THE COLOMBIAN ANDES TO ASSESS THE FAST WARMING OF THE NORTHERN ANDES Daniel Ruiz-Carrascal, Environmental Engineering Program, EIA University, Colombia
11:22-11:34	MULTI-PROXY RECONSTRUCTIONS OF NORTHEAST PACIFIC DECADAL VARIABILITY FROM TREES AND BIVALVES Daniel Griffin, University of Minnesota
11:34-11:46	THE MORE THINGS CHANGE... AN UPDATED TRUCKEE RIVER STREAMFLOW RECONSTRUCTION AND SOME HISTORY OF THE USE OF TREE-RING DATA IN WATER RESOURCE MANAGEMENT. Adam Csank, University of Nevada-Reno
11:50 AM - 12:00 PM	Set up for Lunch
12:00 PM - 1:00 PM	Lunch
1:00 PM - 1:10 PM	Set up for Meeting
1:10 PM - 2:40 PM	Session: Causes and Consequences of Temperature and Hydroclimate Variability during the Common Era (Continued)
1:10-1:22	INCREASED DROUGHT INTENSITY DRIVEN BY WARMING IN THE UNITED STATES' LARGEST RIVER BASIN Justin Martin, U.S. Geological Survey, MT
1:22-1:37	LARGE-SCALE TEMPERATURE RECONSTRUCTIONS FROM TREE RINGS IN NORTH AMERICA: CHALLENGES AND OPPORTUNITIES Bethany Coulthard, University of Arizona
1:37-1:57	UNRAVELLING THE DUAL SIGNAL OF TEMPERATURE AND PRECIPITATION IN BRISTLEcone PINE Andrew G. Bunn, Department of Environmental Sciences, Western Washington University, Bellingham, WA
1:57-2:10	SURPRISING IMPLICATIONS OF LIEBIG'S LAW OF THE MINIMUM FOR TREE-RING RECONSTRUCTIONS OF CLIMATE

	Alexander Stine, SFSU, CA
2:10-2:22	EVIDENCE THAT RECENT WARMING IS REDUCING UPPER COLORADO RIVER FLOWS Gregory J. McCabe, U.S. Geological Survey, Denver, Colorado
2:22-2:34	COLORADO RIVER RESPONSE TO CLIMATE CHANGE SINCE THE LATE 19TH CENTURY Martin Hoerling, NOAA ESRL, Boulder, CO
2:40 PM - 3:00 PM	Break
3:00 PM - 5:30 PM	Session: Contributed Talks; Chair: Connie Millar
5:50 PM - 6:00 PM	Set up for Dinner
6:00 PM - 7:00 PM	Dinner
7:30 PM - 9:30 PM	Poster Session

Wednesday September 19

Time	Event
7:00 AM - 7:50 AM	Breakfast
7:50 AM - 8:00 AM	Set up for Meeting
8:00 AM - 9:00 AM	Keynote: John Harte (Professor of Ecosystem Sciences, University of California) INSIGHTS INTO ECOSYSTEM-CLIMATE DYNAMICS FROM 28 YEARS OF CLIMATE MANIPULATION, LONG-TERM OBSERVATIONS, AND MODELING.
9:00 AM - 10:00 AM	Anticipating climate change impacts in mountains; Chairs: Solomon Dobrowski and John Abatzoglou
9:00-9:15	CLIMATE CHANGE EXPOSURE AND CONNECTIVITY UNDER A WARMING CLIMATE Sean Parks Aldo Leopold Wilderness Research Institute Rocky Mountain Research Station US Forest Service, MT
9:15-9:30	THE ROLE OF DECLINING PRECIPITATION IN WARM SEASON TEMPERATURE AND EVAPORATIVE DEMAND: IMPLICATIONS FOR RECENT WILDFIRE TRENDS IN THE WESTERN U.S. Charlie Luce, USDA Forest Service, ID
9:30-9:45	THE FUTURE OF GLACIERS IN THE AMERICAN WEST, EXAMPLES FROM THE PACIFIC NORTHWEST Andrew G. Fountain, Portland State University, Oregon
9:45-10:00	CLIMATE-DRIVEN CHANGES IN INTERANNUAL VARIABILITY OF SNOWPACK AMOUNT AND TIMING VARY SPATIALLY AND DEPEND ON RAIN-TO-SNOW TRANSITION Adrienne Marshall, Water Resources Program, University of Idaho, ID
10:00 AM - 10:20 AM	Break
10:20 AM - 11:50 PM	Anticipating climate change impacts in mountains (cont)
10:20-10:35	ELEVATION-DEPENDENT WARMING SIGNALS IN THE UPPER COLORADO BASIN ARE SUPPRESSED BY SYSTEMATIC CHANGES IN THE STATION NETWORK Stephanie McAfee, Dept. of Geography and Nevada State Climate Office, University of Nevada, Reno, Reno, NV
10:35-10:50	MICROCLIMATIC BUFFERING IN FORESTS OF THE FUTURE: THE ROLE OF LOCAL WATER BALANCE

	Kimberley T. Davis, Department of Ecosystem and Conservation Sciences, University of Montana, MO
10:50-11:05	LAYING THE FOUNDATION FOR TRACKING CLIMATE CHANGE IMPACTS ON ROCKY MOUNTAIN ALPINE STREAMS WITH LONG-TERM DATA Scott Hotaling, Washington State University, WA
11:05-11:20	EMBRACING VARIABILITY: LESSONS AND OPPORTUNITIES FROM FOREST INVENTORY AND ANALYSIS-BASED TREE-RING DATA Robert Justin DeRose, Forest Inventory and Analysis, Rocky Mountain Research Station, UT
11:20-11:35	INCREASING DROUGHT FREQUENCY CAUSES MULTI-YEAR LEGACIES IN SEMI-ARID FORESTS Paul Szejner, Laboratory of Tree-Ring Research, University of Arizona, AZ
11:35-11:50	THE SPATIAL SCALING OF FLOWERING PHENOLOGY: HOW MUCH COULD LANDSCAPE HETEROGENEITY BUFFER MOUNTAIN MEADOW PLANTS AND POLLINATORS FROM PHENOLOGICAL MISMATCH? Ian Breckheimer, Harvard University Herbaria, MA
11:50 AM - 12:00 PM	Set up for Lunch
12:00 PM - 1:00 PM	Lunch
1:00 PM - 1:10 PM	Set up for Meeting
1:10 PM - 3:00 PM	Workshops/Research Tour; These include instrumentation, iButtons, inside ones like broader impacts, as well as the RMBL showcase including warming experiment
3:00 PM - 3:15 PM	Group Photo
3:15 PM - 4:15 PM	Early Career Scientists; Chairs: Jia Hu and Meagan Oldfather
3:15-3:45	DOMINANT CONTROLS ON MOUNTAIN LAKE PRODUCTIVITY DIFFER BETWEEN SHORT TIME SCALE, REGIONAL DATASETS AND LOCAL, LONG-TERM DATASETS Isabella A. Oleksy, Graduate Degree Program in Ecology, Natural Resource Ecology Laboratory, Colorado State University, CO
3:45-4:15	INTEGRATING PLANT WATER CONTENT, CARBON POOLS, AND BIOTIC INTERACTIONS TO PREDICT FOREST VULNERABILITY TO DROUGHT Gerard Sapes, University of Montana, MT
4:15 PM - 4:30 PM	Break
4:30 PM - 5:30 PM	Early Career Scientists (continued)
4:30-5:00	ADAPTING NATURAL RESOURCE MANAGEMENT TO CLIMATE CHANGE THROUGH SCIENCE-MANAGEMENT PARTNERSHIPS Jessica Halofsky, University of Washington, School of Environmental and Forest Sciences, WA
5:00-5:30	AGENTS OF CHANGE: WEATHER AND CLIMATE EXTREMES IN DRYLAND AND MOUNTAIN REGIONS Benjamin J. Hatchett, Division of Atmospheric Sciences and Western Regional Climate Center, Desert Research Institute, Reno, NV
5:50 PM - 6:00 PM	Set up for Dinner
6:00 PM - 7:00 PM	Dinner
7:00 PM - 7:10 PM	Set up for Talk
7:30 PM - 8:30 PM	Keynote: David Inouye (Professor Emeritus, Department of Biology, University of Maryland and PI Rocky Mountain Biological Laboratory)

THE EFFECTS OF GLOBAL AND REGIONAL CLIMATE CHANGE ON
PHENOLOGY OF
WILDFLOWERS AND ANIMALS IN THE COLORADO ROCKY
MOUNTAINS.

Thursday September 20

Time	Event
7:00 AM - 7:50 AM	Breakfast
7:50 AM - 8:00 AM	Set up for Meeting
8:00 AM - 10:00 AM	Session: Contributed Talks; Chair: Charlie Luce
8:00-8:15	PILOTING A SOCIAL-ECOLOGICAL FRAMEWORK FOR IMPROVING DROUGHT PREPAREDNESS FOR PEOPLE AND NATURE IN THE UPPER MISSOURI HEADWATERS Molly Cross, Wildlife Conservation Society, MT
8:30-8:45	DEVELOPING COLLABORATIVE SOLUTIONS TO SUSTAINABILITY CHALLENGES ACROSS MOUNTAIN SOCIAL-ECOLOGICAL SYSTEMS WORLDWIDE Julia A. Klein, Colorado State University, CO
8:45-9:00	COMMUNITY SNOW OBSERVATIONS - CROWDSOURCED SNOW DEPTH DATA FROM BACKCOUNTRY USERS David Hill, Oregon State University, OR
9:00-9:15	SERVING SCIENTISTS AND STAKEHOLDERS: MONITORING SOIL MOISTURE AND CLIMATE IN THE SOUTHERN ROCKIES Elise Osenga, Aspen Global Change Institute, CO
9:15-9:30	THE EFFECT OF SPATIAL VARIABILITY OF FOREST STRUCTURE ON SEVERITY OF A TREE-KILLING INSECT Michael J. Koontz, Graduate Group in Ecology, University of California, CA
9:30-9:45	SHIFTS OF DEMOGRAPHY AND GROWTH IN LIMBER PINE FORESTS OF THE GREAT BASIN, USA, ACROSS 4000 YEARS OF CLIMATE VARIABILITY: REFUGIAL NORTH SLOPES Constance Millar, Pacific Southwest Research Station, USDA Forest Service, Albany, CA
9:45-10:00	USING ALASKA YELLOW-CEDAR (CALLITROPIS NOOKATENSIS) TO EXAMINE TEMPERATURE VARIABILITY WEST OF THE CASCADE CREST Christopher A. Trinies, Western Washington University, WA
10:00 AM - 10:20 AM	Break
10:20 AM - 11:50 PM	Session: Contributed Talks (Continued); Chair: Andy Bunn
10:20-10:35	LOCAL TOPOGRAPHY INCREASINGLY INFLUENCES THE MASS BALANCE OF A RETREATING CIRQUE GLACIER Caitlyn Florentine, USGS, MT
10:35-10:50	O CHARACTERIZATION OF SNOW GRAIN EVOLUTION ALONG A FOREST-DENSITY GRADIENT ON GRAND MESA, COLORADO Sydney Weiss, Oregon State University, NV
10:50-11:05	LOOKING BEYOND WILDLIFE: USING REMOTE CAMERAS TO EVALUATE ACCURACY OF GRIDDED SNOW DATA Alexej P. K. Siren, DOI Northeast Climate Adaptation Science Center, Ma

11:05-11:20	PROCESSES AND IMPACTS OF DUST AND BLACK CARBON ON SNOW IN THE WESTERN US S. McKenzie Skiles, University of Utah
11:20-11:35	BEYOND LAPSE RATES: SPATIAL HETEROGENEITY IN ENERGY-WATER COUPLING IN MOUNTAIN ENVIRONMENTS Paul D. Brooks, Department of Geology and Geophysics, University of Utah, Salt Lake City, UT
11:35-11:50	A DEMOGRAPHIC PERSPECTIVE ON THE ECOLOGICAL NICHE AND THE GEOGRAPHIC DISTRIBUTION: A RANGE-WIDE ANALYSIS OF CLIMATE AND COMPETITION AS FACTORS LIMITING VITAL RATES OF PINUS EDULIS Margaret E. K. Evans, Laboratory of Tree Ring Research, University of Arizona, Tucson, AZ
11:50 AM - 12:00 PM	Set up for Lunch
12:00 PM - 1:00 PM	Lunch
1:00 PM - 1:10 PM	Set up for Meeting
1:10 PM - 1:30 PM	Overview & Follow-up from Global Climate Action Summit; Chair: Connie Millar
1:30 PM - 3:00 PM	Anticipating climate change impacts in mountains (cont); Chairs: Solomon Dobrowski and John Abatzoglou
1:30 - 1:45	PLANT COMMUNITY REASSEMBLY IN RESPONSE TO CLIMATE CHANGE Janneke HilleRisLambers, University of Washington, WA
1:45 - 2:00	PROVENANCE DIFFERENCES IN ESTABLISHING SUBALPINE TREES AND CONSEQUENCES FOR POPULATION AND SPECIES RANGE RESPONSES TO CLIMATE WARMING Lara M. Kueppers, University of California, Berkeley, CA
2:00 - 2:15	THERMOPHILIZATION OF AN ALPINE PLANT COMMUNITY IN RESPONSE TO EXPERIMENTAL WARMING IN A XERIC MOUNTAIN RANGE Meagan F. Oldfather, University of California Berkeley
2:15 - 2:30	CLIMATE AND TRAITS COMBINE TO DRIVE AN INCREASE IN INSECT HERBIVORY WITH ELEVATION FOR AN ICONIC MOUNTAIN WILDFLOWER Meera Lee Sethi, University of Washington, WA
2:30 - 2:45	WARMING ACTS THROUGH EARLIER SNOWMELT TO DRIVE ADVANCE BUT NOT EXTENSION OF ALPINE FLOWERING PHENOLOGY Meredith D. Jabis, Department of Environmental Science, Policy and Management, University of California Berkeley, 133 Mulford Hall, Berkeley, CA
2:45 - 3:00	Panel and Wrap Up led by chairs
3:00 PM - 3:30 PM	Break
3:30 PM - 5:00 PM	Session: Facilitating collaboration in mountain climate science; Chair: Scotty Strachan
5:00 PM - 5:50 PM	No Host Happy Hour
5:50 PM - 6:00 PM	Set up for Dinner
6:00 PM - 7:00 PM	Dinner
7:00 PM - 7:10 PM	Set up for Movies

7:15 PM - 8:15 PM MtnClim at the Movies: "End of Snow" film featuring billy barr and "Climb-it Change" by Trevor Bloom

Friday September 21

7:00 AM - 7:50 AM Breakfast

7:50 AM - 8:00 AM Set up for Meeting

8:00 AM - 11:50 PM Workshops/Breakouts

11:50 AM - 12:00 PM Set up for Lunch

12:00 PM - 1:00 PM Lunch

1:00 PM MtnClim Adjourns

Mtn Clim 2018

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Meals and Sessions will take place in the billy barr community center (bbcc)

Tuesday September 18

7:30 PM - 9:30 PM

Event

Poster Session

MILLENNIAL SCALE CLIMATE-FIRE-VEGETATION INTERACTIONS IN A MID-ELEVATION MIXED CONIFEROUS FOREST, MISSION RANGE, NORTHWESTERN MONTANA, USA
Mio Alt (Montana State University, Bozeman, MT)

DOES SOIL TEMPERATURE INFLUENCE PLANT FUNCTIONAL TRAIT AND MICROBIAL DISTRIBUTION ON PERIGLACIAL PATTERNED GROUND IN THE ROCKY MOUNTAINS?
Martha Apple, Department of Biological Sciences, Montana Tech, Butte, Montana

CITIZEN SCIENTISTS RETRACE FRANK CRAIGHEAD'S STEPS: REVEALING SHIFTS IN TETON-YELLOWSTONE PLANT PHENOLOGY
Trevor Bloom, Northern Rockies Conservation Cooperative and The Nature Conservancy in Wyoming

SYNOPTIC-SCALE CLIMATE FEATURES AND LAKE AREA CHANGES IN THE WESTERN UNITED STATES
Becky Brice, University of Arizona, AZ

ECONOMIC CONTRIBUTIONS OF WINTER SPORTS IN A CHANGING CLIMATE
Elizabeth A. Burakowski, Institute for the Study of Earth, Oceans, and Space, UNH-Durham, Durham, NH

ASSESSING HIGH-RESOLUTION SATELLITE IMAGERY FOR DETAILED SNOW COVER ESTIMATION: AN ECOLOGICAL PERSPECTIVE
Tony Cannistra, Department of Biology, University of Washington

QUANTIFYING MAGNITUDE AND AGE OF GROUNDWATER FLUX FROM TOPOGRAPHICALLY COMPLEX WATERSHEDS AND IMPLICATIONS OF A WARMING CLIMATE
Rosemary W.H. Carroll, Desert Research Institute, Reno, NV and RMBL, Gothic, CO

AN EXTINCT SPRUCE FROM THE BØLLING INTERSTADIAL OF NORTHERN ARIZONA.
Kenneth L. Cole (Northern Arizona University)

IDENTIFYING AND MAPPING HAZARDOUS SNOW CONDITIONS FOR DALL SHEEP, AN ICONIC NORTH AMERICAN ALPINE UNGULATE, FROM 1980 TO 2017.
Christopher Cosgrove, Oregon State University

RAINWATER HARVESTING SUITABILITY MAP USING FREE DATA AND TOOLS - AN APPLICATION IN MOUNTAINOUS BASIN IN THE HIMALAYAS
Piyush Dahal, The Small Earth Nepal

A NEW APPROACH TOWARDS CLIMATE MONITORING IN ROCKY MOUNTAIN ALPINE PLANT COMMUNITIES: A CASE STUDY USING HERB-CHRONOLOGY AND PENSTEMON WHIPPLEANUS

Justin R. Dee, School of Natural Resources, University of Missouri – Columbia, MO

THE EASTERN WOODLAND-PRAIRIE IN THE COLORADO FRONT RANGE: MODELING THE CLIMATIC NICHE OF PHYSOCARPUS OPULIFOLIUS (ROSACEAE)

Audrey Dignan, University of Colorado Denver, Geography and Environmental Science

THE EASTERN WOODLAND-PRAIRIE IN THE COLORADO FRONT RANGE: MODELING THE CLIMATIC NICHE OF PHYSOCARPUS OPULIFOLIUS (ROSACEAE)

Audrey Dignan, University of Colorado Denver, Geography and Environmental Science

THE DYNAMICS OF EFFECTIVE COMMON PROPERTY RESOURCES GOVERNANCE BY TRADITIONAL AND STATE INSTITUTIONS IN CO-MANAGEMENT FRAMEWORKS: A STUDY FROM A MOUNTAINOUS AREA AND IMPLICATIONS FOR RURAL LIVELIHOODS. Felix Kwabena DONKORa a College of Agriculture and Environmental Sciences, University of South Africa (UNISA), South Africa.

COMBINED EFFECTS OF LAND COVER CHANGE AND FLOW MODIFICATIONS ON HYDROLOGIC FUNCTION IN MOUNTAIN SYSTEMS

Abby Eurich, Department of Ecosystem Science and Sustainability, Colorado State University, Fort Collins, CO

ENVISIONING A MOUNTAINOUS SURFACE ATMOSPHERIC INTEGRATED FIELD LABORATORY (SAIL)

Daniel Feldman, Lawrence Berkeley National Laboratory, CO

BLACK CARBON IS THE DOMINATE DRIVER OF RADIATIVE FORCING ON SNOW BY IMPURITIES ACROSS THE EXTENT OF THE AMERICAN ROCKY MOUNTAINS

Kelly E Gleason, Portland State University, Portland, OR; Joseph R. McConnell, Desert Research Institute, Reno, NV

REPRESENTING COMPLEXITY IN MOUNTAIN SOCIAL-ECOLOGICAL MODELS: LINKING DESIGN AND APPLICATION

Sarah Inman, University of Washington, WA

LONG-TERM DEMOGRAPHIC TRENDS IN A FIRE-SUPPRESSED MIXED-CONIFER FOREST

Carrie R. Levine, University of California, Davis, CA

NEW THOUGHTS ON OLD METHODS: BEST PRACTICES FOR ESTIMATING THE NEAR-SURFACE TEMPERATURE LAPSE RATE

Abby Lute, Water Resources Program, University of Idaho

WINTER WINDS LIMIT UPRIGHT STEM SURVIVAL ABOVE ALPINE TREELINE IN PINUS ALBICAULIS

Colin Maher, W.A. Franke College of Forestry and Conservation, University of Montana, Missoula, MT

RECONSTRUCTING ANCIENT HUMAN AND ECOSYSTEM RESPONSES TO HOLOCENE CLIMATE CONDITIONS IN THE NORTHERN ROCKY MOUNTAINS

Dave McWethy, Montana State University, Bozeman, MT

IMPACT OF CLIMATE CHANGE AND ANTHROPOGENIC PRESSURE ON THE WESTERN GHATS MOUNTAIN: CHALLENGES IN MAINTAINING BIODIVERSITY

Shadananan Nair, Centre for Earth Research and Environment Management, Kerala

CHANGING CLIMATE ALTERING THE HYDROLOGICAL REGIME – A CASE FROM KARNALI BASIN IN NEPAL HIMALAYA

Jeeban Panthi, University of Rhode Island

FORTHCOMING

Greg Pederson, U.S. Geological Survey, MT

CLIMATE PATTERNS ASSOCIATED WITH MAJOR AVALANCHE YEARS IN A REGIONAL TREE-RING BASED AVALANCHE CHRONOLOGY FOR THE U.S. NORTHERN ROCKY MOUNTAINS

Erich Peitzsch, U.S. Geological Survey Northern Rocky Mountain Science Center, West Glacier, Montana

FUNCTIONAL TRAIT VARIATION IN MONTANE FOREST COMMUNITIES OF MT. RAINIER NATIONAL PARK

Kavya Pradhan, University of Washington

LANDSCAPE EVAPORATIVE RESPONSE INDEX (LERI): A HIGH RESOLUTION MONITORING OF ANOMALIES IN EVAPOTRANSPIRATION ACROSS THE CONTIGUOUS UNITED STATES

Imtiaz Rangwala, University of Colorado, Boulder, CO

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