

## *20. The Consortium for Integrated Climate-Related Research in Western North American Mountains (CIRMOUNT)*

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### INTRODUCING CIRMOUNT

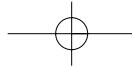
I represent a nascent effort in western North America that is committed to improving integration of climate-related research and its societal implications. We go under the name of CIRMOUNT, that is, Consortium for Integrated Climate-Related Research in Western North American Mountains. In a sense, CIRMOUNT is a North American answer (in the affirmative) to Thomas Schaaf's (UNESCO/MAB) question of whether the global mountain change community represented at Entlebuch wants to continue the Mountain Research Initiative, MRI-UNESCO Mountain Biosphere Reserve (MBR) commitment. The answer is a resounding 'Yes', given that CIRMOUNT is one feasible response from developed countries, which – unlike other network nations here – cannot easily fold into the GEF (Global Environment Facility) proposal.

While I came to Entlebuch assuming that CIRMOUNT was philosophically aligned with MRI's mission, I am now convinced that CIRMOUNT's goals and intents are entirely consistent with MRI, and that CIRMOUNT could be a pilot project of MRI at the regional scale. Recognizing this, Dan Fagre (USGS, another of the CIRMOUNT coordinating group) and I decided that I should ask Harald Bugmann, as Chair of the MRI Executive Steering Committee, if MRI would consider formally endorsing CIRMOUNT as a fledgling project within MRI.

### WHO ARE WE?

CIRMOUNT is a small but growing interdisciplinary group of scientists from physical (climate, hydrology, meteorology) to ecological (forests, fire, ecosystems) sciences, and hailing from universities and public research and land-managing agencies. Together we share a common interest in climate – both directly and for its role as an ecosystem driver.

In the last two years, we have come together at the grass-roots level to launch an initiative whose goal, parallel to MRI's, is to improve integration among climate- and climate-related disciplines and across mountain regions of western North America, and also to improve application of this knowledge in natural-resource management and policy. As of yet, we have no institutional



umbrella, nor dedicated funding. We do, however, have both conceptual and fiscal support for specific activities from our individual universities and agencies.

## WHY ARE WE COMING TOGETHER?

CIRMOUNT responds to four situations in western North American mountain regions:

- A significant amount of research information on climate- and climate-related sciences has accumulated, but it is poorly integrated.
- Although lowland sites are well represented by weather monitoring stations, mountain areas are vastly under-instrumented.
- Escalating demands on western North American mountain ecosystems increasingly stress both natural resources and rural community capacities.
- Scientific knowledge about climate change as well as the need to monitor changes in climate have been virtually ignored in mountain land-use planning and natural resource policy.

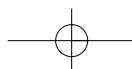
We are proposing a consortium that focuses on a scale that is greater than individual sites or single mountain ranges as is typical for an individual MBR, but less than the global network engaged by MRI. Rather, we aim at an intermediate scale for integration, that is, a regional network of geographically and politically coherent mountain ranges, as is the case for western North America.

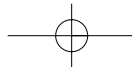
Note that in western North America, unlike most situations discussed elsewhere in the world, our mountain lands, above a certain elevation, are mostly publicly owned and administered. We have systems of National Parks and other state, provincial and federal reserves as well as lands administered by federal agencies such as the US Forest Service and the Bureau of Land Management, which manage lands for multi-use as well as preservation.

## WHAT HAVE WE DONE?

So far we have taken steps to rally ourselves among a small set of colleagues, to better understand the interdisciplinary state-of-research at present, and to prepare an agenda for the future. Activities we have achieved or have in-progress include:

- Consortium for Integrated Climate Research in Mountain Regions (White Paper, February 2003). This unpublished document is a preliminary effort to outline the scope and rationale for CIRMOUNT, and has been used mostly as an internal organizing framework.
- ‘Sierra Nevada Climate Change and Implications for Resource Management’ (special session of the Sierra Nevada Science Symposium, October 2002, Lake Tahoe, California). This session communicated current climate-related research information to an interdisciplinary science and resource-management audience at the scale of a single mountain range. Proceedings in press: <http://danr.ucop.edu/wrc/snssweb/snss.html>
- ‘Integrated Climate Research in Western North American Mountains’ (two-day special session at the 20th Annual PACLIM [Pacific Climate] Workshop, April 2003, Asilomar, Pacific Grove,






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California). Topical presentations on current research, multi-mountain-range scale. Proceedings in press: <http://meteora.ucsd.edu/paclim/agenda03.pdf> (PACLIM homepage: <http://meteora.ucsd.edu/paclim/>).

- Installation of a remote-accessed high-elevation meteorological station at White Mountain/Barcroft Summit, California, October 2003. <http://www.wrcc.dri.edu/weather/wmtn.html>
- ‘Mountain Climate Science Symposium’ (MCSS). 25–27 May 2004, Lake Tahoe, California. CIRMOUNT’s ‘coming out’ event, this three-day symposium is devoted to developing a framework and agenda that will guide the CIRMOUNT initiative in coming years. Not a traditional conference with research presentations, MCSS will feature a small number of plenary talks on state-of-science in priority topics, but will be, as at the MRI/UNESCO Entlebuch event, primarily a working meeting. The symposium is limited to 100 invited participants, who will contribute ideas during facilitated discussion groups. <http://www.fs.fed.us/psw/mcss/>

Goals of the MCSS are:

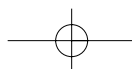
- Summarize states-of-knowledge in four priority topics of climate and climate-response research for mountain regions of western North America.
- Develop support for long-term, interdisciplinary, and integrated climate and climate-related research and monitoring in western mountains.
- Facilitate communication and understanding of climate sciences and their implications to local and regional resource managers and decision-makers.
- Promote data integration, quality assurance, management, and archival capacities for climate-related databases.
- Establish a roadmap for long-term regional integration of climate sciences, assessment, natural resource policy and management.

The set of plenary speakers and discussion leaders from MCSS will join CIRMOUNT’s coordinating group following the symposium to produce a framework publication that describes priority topics, questions, and problems, and outlines opportunities for improving coordination, collaboration, and communication among western North American climate- and climate-related scientists, resource managers, and policy specialists. With this written framework, we will then seek funding and further endorsements within appropriate institutional contexts. As well we hope the framework will encourage voluntary buy-in from individual researchers who would see benefit both to their own work and to the regional science community by aligning their research with the CIRMOUNT programme.

### WHAT ACTIONS DO WE FORESEE FOR THE NEAR FUTURE?

Specific target activities that we propose could develop from the MCSS include:

- Institute ‘MACLIM (Mountain Climate) Biennial Workshops’. Research meetings based on the PACLIM (Pacific Climate) Workshop model would alternate every other year with PACLIM to



- focus specifically on current research findings relevant to CIRMOUNT topics and goals. These would follow the PACLIM approach, although unlike PACLIM, which are regularly held at Asilomar, California, they would preferably rotate around mountain-region host sites.
- Add GLORIA Multi-Summit and Master Station Sites. One site exists now at Glacier National Park, MT. Opportunities/priorities for additional sites include:
    - Sierra Nevada (Multi-summit)
    - White Mtns (Multi-Summit and Master Station: Univ. Calif. White Mountain Research Station)
    - Cascades/Olympic Mtns (Multi-Summit)
    - Central Rocky Mtns (Multi-Site and Master Station: Niwot LTER – Long-Term Ecological Reserve)
  - Add High-Elevation Meteorological Stations. Ray Bradley (Univ. MA, Amherst) has made (at Entlebuch) a formal proposal that MRI/UNESCO sponsor and administer an extended GCOS (Global Climate Observation System) network of monitoring stations globally at high elevations in MBRs. He described the recently installed station on White Mtn/Barcroft Summit, CA (Dan Cayan, SCRIPPS, WMRS) as a defining model. Priorities for additional stations in our region include: Sierra Nevada, Cascades/Olympic Mtns, Central Rocky Mtns, Colorado Plateau.
  - Initiate and expand projects that effectively communicate climate-change science into conservation and resource management contexts. Specifically:
    - expand the ‘Climate-Friendly Parks Initiative’ to additional National Parks. Priorities: Olympic-N Cascades National Parks (NP), Yosemite NP, Sequoia/Kings NP, Rocky Mtn NP
    - collaborate and promote the ‘Sierra Nevada Climate Change Assessment Project’ (SNC-CAP), a USFS-collaborative proposal to assess regional climates and effects on natural resources and local communities, and to develop scenarios and tools for managers.
  - Seek allocated funds for CIRMOUNT, for example, direct Congressional solicitation, NCEAS (National Centers for Ecological Analysis and Synthesis), other grant opportunities.

These are examples of immediate priorities for CIRMOUNT. We eagerly anticipate working within the MRI/UNESCO-MAB network as an example of regional mountain-climate science integration.

## CIRMOUNT COORDINATING GROUP

Co-Chairs:

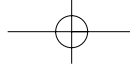
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