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MRI Newsletter 7: Promoting Global Change Research in the American Cordillera

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Improving Governance in the Mekong Region

The Mekong Program on Water, Environment and Resilience (M-POWER)

M-POWER
Mekong Program on Water Environment and Resilience

M-POWER—the Mekong Program on Water, Environment and Resilience—is a program of action research that aims to improve the quality of water governance in ways that support sustainable livelihoods in the Mekong Region. The acronym is a play on the verb "empower," as this is an apt one-word description of motivation for engaging in action research about governance with a view to bringing about progressive changes.

By **Mekong** we mean the broad region of mainland Southeast Asia, not just the Mekong river basin, but an area that also includes the Irrawaddy, Salween, Chao Phraya, Red and other smaller river basins in between (see the map on page 278 of this issue of *MRD*). The idea of a **program** is that we are trying to develop a coherent set of action research activities that extend beyond a single project or grant. Our focus is on inland **water**, where water is treated as: a multipurpose resource to be enjoyed for livelihood activities; a threat or a disaster, as in the case of unexpected floods; a resource for generating energy; or an important medium for aquatic life. By **environment**, we are signaling our interest in both biological and non-living aspects of our world. Finally, we introduce the idea of **resilience** because it describes our concern for maintaining capacities to adapt and cope with change in a context where human society and the environment are seen as dynamic, multi-scale, and interrelated. The Program will be pursued for at least 4 years: 2005–2008.

Comparative studies and governance themes

The framework is organized around empirical *comparative studies* carried out by multi-country teams, and governance *themes* for synthesizing our experiences. The *comparative studies* are all comparative or regional, with each one usually composed of several ongoing action research studies. Action research means the work often involves being engaged in the political debates and actions we are analyzing and commenting upon. This significantly increases the levels of responsibility for doing our work well. Our program aims to draw lessons from these experiences through critical comparison and exchange of experiences.

There are 4 *themes* to help organize thinking about broader lessons concerning governance, which may cut across several or all politically related water situations represented in the comparative studies. Each of the comparative studies and themes has clear leadership, with responsibility for preparing written working papers. These will become peer-reviewed papers or policy briefs, or be distributed more widely through conventional media channels.

Comparative studies

- C1 Fisheries: ensuring food security
- C2 Floods: reducing the risks of disaster
- C3 Irrigation: managing supply and demand
- C4 Hydropower: meeting energy needs fairly and sustainably
- C5 Watersheds: securing resilient livelihoods
- C6 Water works: providing water for households and industry

Themes

- T1 Dialogue: deliberation, diplomacy, and negotiation
- T2 Social justice: gender, ethnicity, and class
- T3 Knowledge: assessment, practice, and communication
- T4 Policies: integration, decentralization, and privatization

T1: Dialogue—deliberation, diplomacy, and negotiation

This theme aims to develop alternative models in environmental decision-making in the context of water resource governance in the Mekong Region. More specifically, it will examine the limitations of state-dominated processes and inquire into the potential for greater civil society involvement in the processes. This theme will also endeavor to find better structures for fostering regional and global cooperation, promoting human security, and preventing conflict in relation to water resources at all levels, from the local to the regional.

Much of the existing dialogue about water in the region is removed from the public eye. This theme will critically reflect on whether and how multi-stakeholder platforms could bring water policy and policy-making into the public domain. To accomplish this, members of our network will actively engage in water forums: on-going workshops, meetings, public hearings, and negotiations revolving around a set of interconnected water resource management and policy issues. Our analysis will pay careful attention to a wide variety of participants—as well as, importantly, relevant non-participants—including their discourses, relations, and the processes through which their interactions unfold.

T2: Social justice—gender, ethnicity, and class

This theme explores the social justice challenge of reducing differences in opportunity, rights, involuntary risks, sharing of benefits, and access, by changing the form of engagement in water governance. Attention is focused on issues of gender, ethnicity, and class.

For example, this involves investigation of the conditions and terms under which women as stakeholders participate in the governance of water resources, as well as the con-

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sequences of their participation for their wellbeing, especially in relation to health and food security. Similar questions are asked about other potentially socially vulnerable groups in the region, particularly ethnic minorities, immigrants, urban slum dwellers, and landless farmers. Finally, there is consideration of how class, ethnicity, and gender issues intersect, and the interdependencies thus generated.

The social justice challenge is not just a question of process, but also one of outcomes and impacts on the livelihoods of marginalized groups. Action research requires identification of inequalities, followed by work to improve outcomes for the disadvantaged. Changing discriminatory and unfair practices that result in unequal rights, benefits, and work is difficult but a key goal of the M-POWER program.

T3: Knowledge—assessment, practice, and communication

This theme addresses how different forms of knowledge inform decision-making and action. It aims to span and integrate understanding, from formal assessment processes established by governments and inter-governmental agencies to the diverse kinds of local and organizational knowledge that are often embedded in practices. Because the media can be very important in raising public awareness, shaping public opinion, and propagating myths, we directly address the role of media and communication in development.

Water resources management has a major technical component, whether it is forecasting growth in energy demand, anticipating the effects of climate change, modeling the impacts of diversions, in-stream structures, and land uses in surrounding watersheds, or exploring scenarios for the future of economic and social relations. Access to, and the capacity for, analysis are highly differentiated in Mekong societies. This calls for great social responsibility on the part of technical experts and their managers, given that they sit in bureaucracies with often strong organizational interests in particular types of rationales and findings. The science–policy interface must therefore be negotiated and neither side can ever be completely independent of the other.

T4: Policies—integration, decentralization, and privatization

This theme analyzes the history of state and regional water policies, paying particular attention to how benefits and involuntary risks are shared, how cross-sectoral competition and coordination are handled, and the ways in which issues become embedded in public policy. We take as a starting point the changes in formal laws and regulations related to water resources and the specific management and infrastructure development activities undertaken or facilitated by the state, focusing on privatization and decentralization reforms and how these alter rights to water.

We then extend our consideration to non-actions that in themselves constitute key policy choices, as well as the impacts of policies that are often critical while conventionally considered as non-water. Here we anticipate special attention being given to agriculture, fisheries, conservation, and energy. Finally, we will complement our policy analysis with institutional analysis of the interactions of actors in the bureaucracy, parliament, non-governmental organizations, and various stakeholders at different stages of the policy cycle.

There exists little whole-of-state, whole-of-Mekong-basin or whole-of-Mekong-Region analysis of the policy positions of each state, their shifting tides, and the driving forces with the most influence. Nor is there a clear picture of how actual processes are governed by formal policy postures. This theme will strive to rectify this.

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MRI Newsletter 7: Promoting Global Change Research in the American Cordillera

The MRI recently co-sponsored the conference "Climate Change: Organizing the Science for the American Cordillera (CONCORD)." This conference summarized current research and identified scientific gaps and research needs to support adaptation to global change along the Cordillera from Alaska to Tierra del Fuego. Immediately after the conference the MRI sponsored the "Cordillera Transect Workshop" in order to design concrete projects to fill these research gaps.

CONCORD: the first inter-American conference on global change research along the American Cordillera

Mendoza, Argentina, is the home of IANIGLA, the Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales (Argentine Institute for Snow Studies, Glaciology and Environmental Sciences). From 4–6 April 2006 IANIGLA's director, Ricardo Villalba, hosted CONCORD with its 150 participants as well as 3 side events (a meeting of the Working Group on Snow and Ice of the UNESCO Latin American Hydrological Program, an IHDP Networking in the Andes meeting chaired by Fausto Sarmiento, and the Cordillera Transect Workshop organized by the MRI). The MRI was part of the Organizing Committee (co-chaired by Henry F. Diaz of NOAA and Ricardo Villalba), and the manager of program development and invitations.

Mountain regions of the western American Cordillera may be especially vulnerable to changes in climate, to the ensuing changes in snowpack, streamflow, and ecosystem functioning, and to a host of impacts on human and natural systems. In these mountain regions small perturbations in global processes can cascade to produce large changes in both highlands and lowlands, ultimately affecting the health, safety, and prosperity of people throughout the region.

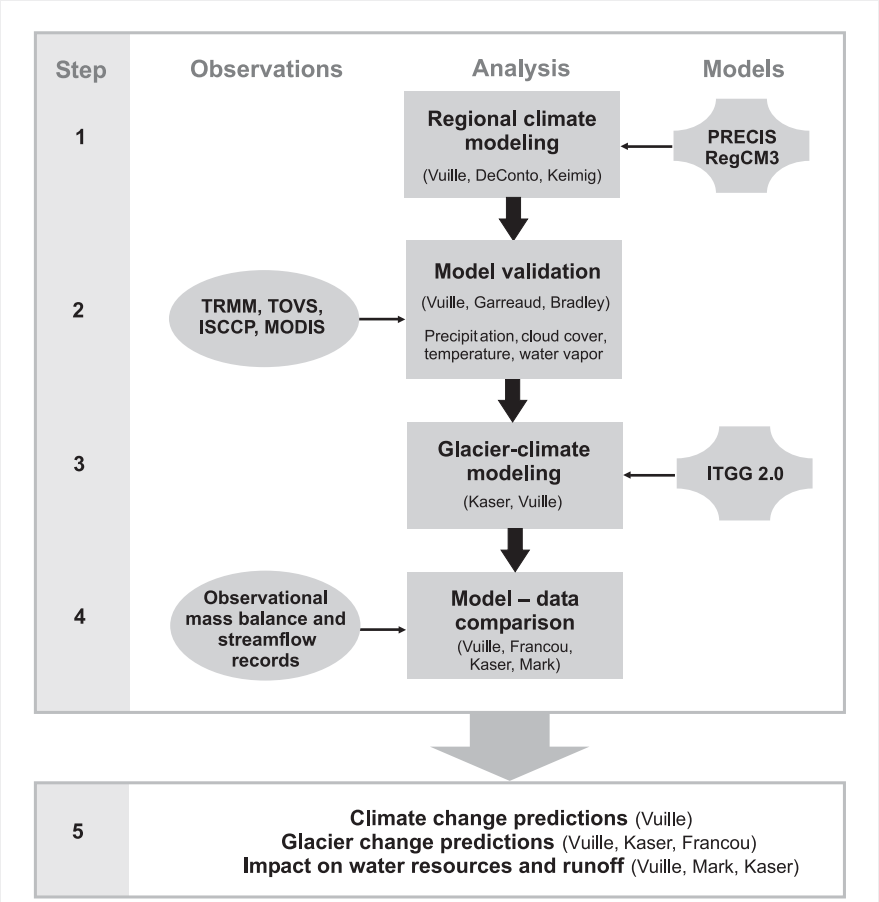


FIGURE 1 Flow chart of proposed modeling and validation studies, and participation of members during the stages of the project.

Outcomes of the conference

Excellent presentations over 3 days yielded insights into topics, methods, and findings of current global change research along the American Cordillera. Some of the urgent topics identified with respect to earth system functions were:

- A dearth of meteorological observations at high altitudes;
- Uneven geographical distribution of monitoring sites;
- Scaling up from benchmark stations;
- Determination of the true range of historic variation in climate and environmental conditions;
- Linkage of climate to hydrology;
- Monitoring multiple variables in the same areas (climate, biology, hydro);
- Interaction of climate with fire and insects in changing forest composition;
- Lack of central depository for climate data from all sources (national meteorological services, power companies, and individual researchers or programs).

Some of the urgent topics identified with respect to impacts on people and resources were:

- Thresholds of climatic change and variability: when does a change in climate translate into an important impact?

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Example of current research

Climate Change in the Tropical Andes—Observations, Models, and Simulated Future Impacts on Glaciers and Streamflow

The tropical Andes are one of the regions where recent climate change is most evident. As a result, glaciers are receding, with potentially severe consequences for the availability of drinking water, and water for irrigation, mining, and hydropower production.

General Circulation Models (GCMs) run with a $2 \times CO_2$ scenario predict additional warming of more than 2.5°C by the end of the century. However, great uncertainties exist about these projections: the coarse resolution of GCMs is inadequate to resolve the meso- and local-scale circulation features associated with steep Andean topography.

We have started a new project aimed at simulating climate variability and change in the Andes under both present-day conditions and different IPCC-SRES emission scenarios (2071–2100) with 2 regional climate models (PRECIS and RegCM). With this project we will, for the first time, establish robust projections of how glaciation, runoff, and downstream water availability will change in this region by the end of the 21st century.

The following research framework was proposed (Figure 1):

1. Two regional climate models (RCMs), PRECIS and RegCM3, will be used to simulate present-day climate.
2. The simulations will be validated with observational data. Since many parts of the tropical Andes are devoid of in-situ data, we will complement surface data with observations from space from different sensors (TRMM, TOVS, ISCCP, MODIS). We will focus on glacier-relevant variables: precipitation, cloud cover, temperature, water vapor.
3. Output from the RCMs will be used to feed a tropical glacier-climate model (ITGG 2.0). This model will yield estimates of glacier mass balance and streamflow in selected catchments.
4. The results from the glacier-climate model will be validated with observational mass balance and streamflow records.
5. To assess the potential impact of climate change on glaciation and streamflow from glacierized catchments, we will repeat the analysis with the ITGG 2.0, this time using simulated climate for 2071–2100 under IPCC Special Report on Emissions Scenarios (SRES) A2 and B2 conditions as an input into our glacier-climate model. We will thus be able to present robust projections of the impacts of climate change on tropical Andean glaciers and water resources at the end of this century.

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- Linkage of fundamental research to applied concerns;
- Relevance of stakeholder perception in defining scientific questions;
- Mechanisms by which scientific results influence policy;
- Adaptation of existing reservoir and water management systems;
- Interaction with additional global change drivers in Latin America: economic development, population movements, rapid and extreme land cover change with impacts on air quality, and water use.

The program and the presentations (as webcasts) are available at the MRI website: http://mri.scnatweb.ch/content/category/7/44/66/. The abstracts volume, the meeting summary and the list of participants can also be found here.

The American Cordillera Transect Workshop

This workshop offered an opportunity to sign up for concrete collaboration addressing the issues raised in the CONCORD conference through the development of specific research projects in sites along the American Cordillera.

The long-term goal of the Cordillera Transect is to establish a transect of pole–equator–pole global change research sites and to integrate their researchers in a trans-American network working with comparable methods. Data and results can thus be shared and compared. In addition, the MRI is aiming for interdisciplinary projects, ie projects that examine the basic functioning of the earth systems **and** the impacts, as well as transdisciplinary work, to promote stakeholder involvement in project development.

The workshop launched the American Cordillera Transect with 6 international working groups established at the end of the day. The groups have 6 months to develop project descriptions to be used by the participants in the development of funding proposals. A successful project description will specify the precise research themes and methods, the timetable, the institutions and researchers involved, and the sources of funding.

The contact persons and participants in the working groups on Science and Stakeholders, Hydrological Modeling, Forests, Biodiversity, Land Use and Land Cover Change, and Climate Data can be found at: http://mri.scnatweb.ch/content/category/3/45/67/.

The American Cordillera Transect is the first instance of MRI's Real Projects in Real Places

The GLOCHAMORE Research Strategy laid out a global template for global change research in mountain regions. The MRI's Dr. Astrid Björnsen Gurung took the scientific lead of the "Global Change in Mountain Regions" (GLOCHAMORE) project, of which the major product was the GLOCHAMORE Research Strategy (see also *Mountain Research and Development* 26(1), pp 282–283; for the Research Strategy go to http://mri.scnatweb.ch/content/view/74/31).

It is now the MRI's task to initiate and support regional networks of global change research. Regional foci are the American Cordillera, the European Mountains, North and Central Asia, Southeast Asia, and Africa.

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