

# **Development of a collaborative Research Network for the study of Regional Climate Variability and Changes, their Prediction and Impact, in the MERCOSUR Area.**

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## **Introduction**

We have proposed to create a Collaborative Research Network (CRN) to promote research into the causes of climate variability in the Mercosur region of South America. Scientists from the Mercosur countries (Argentina, Brazil, Paraguay, and Uruguay) will lead the effort, although scientists from the United States will also participate. The purpose of the CRN is to support an environment conducive to collaborative research. This will be accomplished by sponsoring scientific visits to each of the participating institutions holding regular meetings where results will be disseminated and discussed, and by encouraging the free exchange of data.

Problems involving climate variability and the human response to that variability are quite complex and it is clearly impossible for one group to address even a single problem effectively. At present, however, there are many barriers to effective collaboration, including the physical separation between groups, a lack of communication between disciplines, an historical resistance to the open exchange of data, and language barriers. It is believed that by providing an environment conducive to collaboration, the barriers will be reduced and the pace of research will accelerate, more rapidly. Result will be in predictive capability and an understanding of how to make best use those predictions, ultimately resulting in a benefit to the population within the region.

The proposed CRN was designed through a series of meetings and workshops involving scientists of the MERCOSUR region and USA. The research will focus on the following:

**MAIN GOAL: To advance the knowledge of regional climate variability and change, their prediction and impacts, in the MERCOSUR region,**

With the following specific objectives:

- 1. The role of large-scale sea surface temperature variations in determining climate variability in southeast South America.*
- 2. To study the tropical-extratropical interactions related to the circulation and precipitation variability over the mercosur area.*
- 3. Impacts of climate variability on sectors of social and economic importance in the mercosur region*

The countries and participating organizations are:

- *ARGENTINA*: Centro de Investigaciones del Mar y la Atmósfera (CIMA). CONICET/UBA, and Departamento de Ciencias de la Atmósfera y los Océanos. UBA.
- *BRAZIL*: CPTEC-INPE, Universidade Federal do Paraná and Universidade de Sao Paulo.
- *PARAGUAY*: Facultad de Ciencias Exactas y Naturales and Facultad Politécnica. Universidad Nacional de Asunción
- *URUGUAY*: Facultad de Ciencias. Universidad de la República.
- *USA*: NOAA/ERL/CDC and Department of Meteorology, University of Maryland.

From the above mentioned institutions, the main scientists involved are:

*Argentina*: M. N. Nuñez (PI), V. R. Barros, G. Berri, M. Nicolini, W. Vargas and C. Vera.

*Brazil*: T. Ambrizzi, I. Cavalcanti, A. Grimm, J. Marengo, C. Nobre, M. A. Silva Dias and P. L. Silva Dias

*Paraguay*: G. Coronel and B. Grassi.

*Uruguay*: M. Bidegain and M. Caffera.

*USA*: E. Berbery, H. Diaz and B. Liebmann.

In addition to the scientist objectives, the network propose to make a significant contribution to the **capacity building** in the region by training Ph.D. Students, who will contribute to the development of policy in issues of Climate variability and change, and prediction of climate. An enhancement of the smaller groups will be also promoted.

### **Potential of the Project for interaction with policy makers and stakeholders**

The MERCOSUR region of South America is home to more than 200 million people. That population is profoundly affected by both short- and long-term climate variability. The majority of the MERCOSUR's Gross Domestic Product is centered in the study region and a large percentage of its energy is hydroelectric. In consideration to the mentioned above, the CRN will intent to bridge the gap between the science results generated by the program and the information needs of decision and policy makers providing mechanisms to transform research results into information designed to address specific problems.

It is well known that Climate Prediction from seasonal to interannual scales will impact positively on the following sectors:

- Agriculture
- Water resources and water management
- Fishing
- Tourism
- Transportation, etc.

## **Applications Component**

In the planning meetings for the establishing of the Program, it was specifically recommended that an applications component be included from the beginning of our research activities. The objective of this research theme is to explore all the components and steps necessary, to ensure the successful transfer of scientific results on climate variability to potential users of climate information. This exploration that is most likely to succeed if undertaken in the context of one or more pilot programs addressing climate related problems of regional importance.

### **Rio de la Plata - Paraná Basin. A Pilot Project**

In the planning stage, a regional pilot project focused on hydrology was formulated in somewhat more detail. The objective of this pilot project is to assess the impact of climate variability on surface runoff and streamflow for the Río de la Plata - Paraná Basin (Cuenca del Paraná - Plata) and its sub-basins.

A second Pilot Project focused on the *Climate impacts on Agriculture* will be addressed on the third year of the CRN.

### **Data needs and management**

Data exchange should be free and open. We have some facilities and experience at the major participant institutions to manage data. Software developed by LBA Program will be transferred to the CRN. This software (IAI-DIS) will facilitate to members of the project the access to a common Data Bank.

### **Plan for communicating results**

Results will be communicate periodically to scientists, policy makers and stakeholders throughout workshops (for scientist and non-scientist persons), conferences, publication in specialized journals and finally, producing a book on climate variability and changes, their potential for prediction in South America.

### **Possibilities for enlarging the funding base of the program**

We expect to enlarge the funding base of the project throughout existing binacional governmental cooperation programs, applying for funds to national funding agencies (e.g. Agencia Nacional de Promoción Científica y Tecnológica, FAPESP, etc.).

Mainly, we expect a fast growing of the CRN in order to apply to International Agencies for funds focused to a Research and Applications Program on Climate in South America.