

Proposal
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Regional multi-proxy climate reconstruction for southern South America

A new initiative under the IGBP-PAGES umbrella
(International Geosphere Biosphere Programme: Past Global Changes)

By

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The Goal

High-resolution multi-proxy climate reconstructions for the past ca. 1000 years and their associated regional features and uncertainties are priority areas of research within IGBP-PAGES initiatives (Wanner 2005). Considerable progress has been made in the quantity and quality of proxy data sets, in the handling of a wide range of high- and low-frequency proxy data, in the reconstruction techniques, and in the understanding of climatic processes at continental, hemispheric and global scale (e.g. Bradley et al. 2002; Mann et al. 1998; Esper et al. 2002; Jones et al. 1998; Luterbacher et al. 2004; Moberg et al. 2005, Pauling et al. 2003 and others). Most of the state-of-the-art research has been concentrated in the Northern Hemisphere. Yet very little information exists for the Southern Hemisphere (Jones et al. 1998, Bradley 2003). However, the Southern Hemisphere is a key area for the detection of the anthropogenic signal in the global climate system (Shindell and Schmidt 2004). In consequence, long-term high-resolution reconstructions for the Southern Hemisphere are essential for predicting any change in a future climate related to human activities.

Regional climate changes and extremes exhibit much larger amplitudes than hemispherical and global reconstructions, because regional variability is smoothed out over hemispheric or global means. Hence regional climatic reconstructions are critically important since natural resources and socio-economical activities are largely regulated by climate at local scales. In this context, the monthly to seasonal reconstructions of climate for Europe since 1500 AD (Luterbacher et al. 2004; Xoplaki et al. 2005) and drought reconstructions for the western US (Cook et al. 2004) have set new standards. Similar studies are missing for other regions of the world.

Under the umbrella of IGBP-PAGES, the International Geosphere-Biosphere Past Global Changes programme (and/or PAGES/CLIVAR), a collaborative longterm initiative will seek

- (i) to collate the large number of dispersed already existing and new paleoclimate data sets (documentary data, tree rings, glaciers, marine and lake sediments etc.) for the last ca. 1000 years available for South America, and
- (ii) to use the Mann et al. (1998), Luterbacher et al. (2004) and Moberg et al. (2005) methodologies to work towards a regional reconstruction at different temporal and spatial resolution with associated uncertainties for southern South America.

Organization

This project is conceived as a bottom-up collaborative initiative that will involve many research groups from different countries working within a common cooperative frame for a common goal. For this purpose, we intend to put our initiative under the umbrella of IGBP-PAGES to warranty the most appropriate institutional framework, ensure visibility, and thus encourage collaborative participation. We also consider that PAGES might envisage a major worldwide research initiative and stimulate similar high-resolution regional climate reconstructions in different parts of the world using the same methodological framework.

A small group (6-8 participants) of scientists with recognized expertise in different types of paleoclimatic archives will meet at Mendoza, Argentina in October 2005. The goal is to set up an organizational framework for collaboration, prepare guidelines for contributors and formats, and discuss participation of groups in the project and contributions of data sets.

A formal announcement and invitation for collaboration will follow thereafter. Work will continue decentralized in different labs. One person will work 12 months at IANIGLA Mendoza (affiliated with Ricardo Villalba) for project management, IT and support of the project coordinators.

A first science meeting in South America (e.g., Medoza, Argentina) is planned for October 2006. The state of research and the data sets will be presented and discussed. Data collection will come to an end and the reconstruction work will be started.

2007: Reconstruction, preparation of a collaborative publication. Evaluation of the project and discussion of further steps.

Responsibilities

The initiative is coordinated by Ricardo Villalba (IANIGLA Mendoza, Argentina, PAGES SSC member for South America) and Martin Grosjean (NCCR Climate, University of Bern, Switzerland).

A small group of people (one or two per type of archive) will liaise with the respective community and constitute the "Coordination committee".

Milestones

June-September 2005:

- Proposal, budget and endorsement by IGBP-PAGES

- Contact and nomination of the Coordination Committee.
- Announcement of the project

8 – 9 October 2005: Start-up meeting of the Coordination Committee at Mendoza

- Participants: Villalba, Grosjean, Luterbacher, 5-6 “coordinators” ; Peter Kershaw Monash U (as a representative for Australia to spread the idea)
- Organization: Villalba and Grosjean
- Goals: Constitution of Working Groups, working plan, rules and regulations (codex), data base structure, formats and guidelines for contributors, general project organization.

October 2005 – September 2006

- Information and formal invitation of contributors
- Collection and elaboration of data sets
- Link with CONCORD, a symposium “Climatic Sciences of the North and South American Cordillera” (February - March 2006, coordinated by H.F. Diaz and R. Villalba)

October 2006 Follow-up meeting (science meeting) Mendoza

- Participants: “Coordination committee”, working groups, open to interested participants; could ideally be coordinated with the PAGES SSC Meeting 2006; ca. 15-20 participants.
- Organization: Villalba and Grosjean
- Goals: Presentation and discussion of data sets, next steps

2007 Reconstruction and preparation for publication

- data set collection continuing
- Discussion of next steps

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