

WORKSHOP REPORTS

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features, and their investigation, will be incorporated explicitly into the Science Plan for ScanTran.

In the final plenary session of the meeting agreement was reached as to the identity and structure of ScanTran and its scientific priorities. It is proposed that the Science Plan will be structured around three themes: 1. Understanding the processes and mechanisms of ecological change in response to environmental changes, with a clear focus upon the three principal ecotones of the region as identified at the Trondheim meeting (Nemoral and Boreal forest, forest and tundra, continuously and discontinuously vegetated tundra); 2. Integrating and synthesizing the likely responses of ecosystems to scenarios of potential environmental change, with landscape- to regional-scale modelling, GIS and remote-sensed data underpinning the assessment of the consequences of these responses for, for example, water supply, trace-gas fluxes, the forestry industry, reindeer husbandry, etc.; and 3. Examining the options for adaptation to changes and/or for the mitigation of undesirable changes, including the policy and other options. It also is clearly envisaged that there will be feed-forward and feed-back processes whereby results from each theme will then influence further research in the other two themes.

In order to carry forward the development of the Science Plan and of the ScanTran concept, a Steering Committee was established at the meeting. Nils Roar Sælthun (NIVA, Oslo) and Janne Hukkinen (Arctic Centre, University of Lapland) were nominated as the Chair and Vice-chair respectively of this committee. It also was proposed that the Steering Committee should have representatives from the series of relevant IGBP Core Projects (GCTE, BAHG, IGAC and PAGES at this time) as well as seeking representation from the IHDP; Brian Huntley is for the present the PAGES representative on the Steering Committee. In addition to the establishment of the Steering Committee, an offer was received from the CIRC (Kiruna) to host the ScanTran office and secretariat facilities; pending an application for funds to support this adequately at least some limited facilities would be made available immediately.

Members of the PAGES scientific community with research interests in Fennoscandia, the northern parts of European Russia or the European Arctic from east Greenland to Franz Josef Land should look out for future news of ScanTran that will be disseminated from time to time through further reports in this Newsletter as well as via a ScanTran home page that will be established later this year. If all goes according to the schedule outlined at the meeting then the Science Plan should be published by IGBP in 1999. This will identify pri-

ority research targets with respect to past environmental and ecological changes in the region; implementing the research towards these targets then will be a task for the PAGES community who will need to seek funding for their work in the usual ways.

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Changes in the Geosphere-Biosphere during the last 15,000 Years

BONN, GERMANY, FEBRUARY 6-7, 1998

A fundamental understanding of the processes which have governed the terrestrial ecosystem and its evolution during the most recent period of Earth history has yet to be achieved. Natural archives, viewed within an archaeological context, provide a unique glimpse into the evolution of natural changes alongside the influence of mankind. In these records lie the clues required to disentangle past natural changes from those due to anthropogenic influences. In addition, they provide a spatial and temporal framework of past terrestrial ecosystem change upon which to base understanding of modern and potential future changes. These are the overriding goals of the multidisciplinary Deutsche Forschungsgemeinschaft priority program, designed as a contribution to PAGES research, funded from 1994 through 2000. Three time slices are defined within this program: (1) the transition from last glacial to early Holocene, (2) the postglacial climatic "optimum" and (3) the beginning of intensive use of natural resources by humans (ca. 1500 BC to 500 AD).

The Bonn workshop, which followed up on the initial agenda setting meeting of January 1995, concentrated on improving inter-project collaboration and dissemination of initial results through the establishment of the PANGAEA (PaleoNetwork for Geological and Environmental Data) database. Representatives of the more than 40 individual

projects within this program were in attendance presenting results from a diverse suite of records in coastal sediments, peat, lake sediments, fluvial records and tephra. One of the key topics of discussion was the importance of comparison of the continental records being investigated under the auspices of this project with the variability which has been found in nearby marine sediment records from the North Atlantic. Another key message, especially in terms of the most recent records, was that the problem of separating and understanding natural vs. anthropogenic change provides a challenge to develop new and innovative thinking, methods, and techniques for using paleoarchives.

Representatives from comparable projects in Great Britain, Switzerland and the Netherlands were invited to put the project in the larger European context while presentations from representatives of the PAGES WDC-A database in Boulder and the PAGES IPO stressed the need for compatibility and sharing with existing international paleoclimate databases. The German IGBP office announced during the meeting the availability of three travel grants to support participation of young German scientists at the PAGES Open Science Meeting.

PANGAEA is an information system to archive, publish and distribute data from Global Change research with special emphasis on paleoclimatic, marine and environmental sciences. Data are stored with related meta-information in a relational database, accessible through a client/server system. The web client requires a browser with JAVA capabilities and write permission to the individual user's hard drive. Examples, help menus, and geographical plotting routines are provided to facilitate ease of operation and data retrieval. The guest user interface allows access to published data while a login is required for inter-project use of as yet unpublished data.

PANGAEA is physically housed at the Alfred Wegener Institute in Bremerhaven and is involved as the data management system for numerous German, European Union and international projects including:

- ADEPD Atlantic Database for Exchange Processes at the Deep sea floor (EC)
- CRP Cape Roberts Project (International) Ice sheets and climate (EC)
- Natural Climate Variability (BMBF)
- QUEEN Quaternary environments of the Eurasian North (ESF)
- SFB 261 The South Atlantic in the Late Quaternary: Reconstruction of tracer composition and current systems (DFG)
- Changes in the Geosphere-Biosphere during the last 15,000 years (DFG)

For further information on the "Changes in the Geosphere-Biosphere during the last 15,000 years" project contact the project coord-

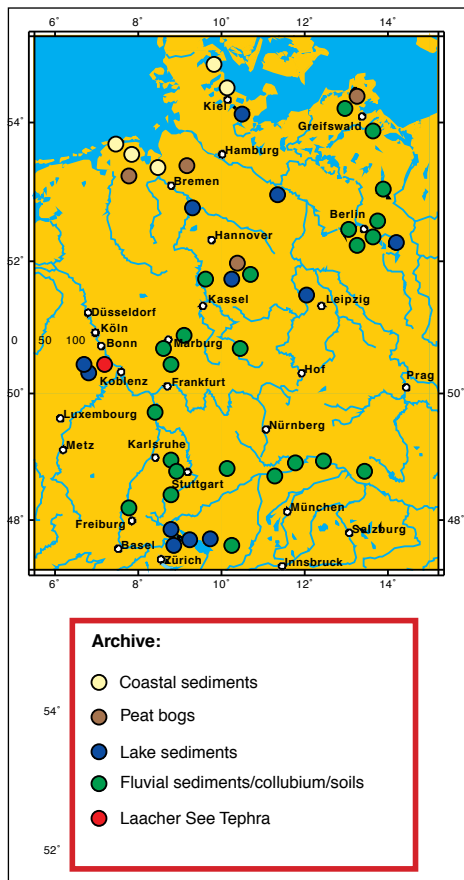


Fig. 13: Archive site locations for the "Changes in the Geosphere-Biosphere during the last 15,000 years" project.

director Prof. Dr. Wolfgang Andres (andres@em.uni-frankfurt.de) or access the internet site <http://www.rz.uni-frankfurt.de/FB/fb17/ipg/spp/> (an English version of this site is under construction). For further information on PANGAEA e-mail info@pangaea.de or access the internet site <http://www.pangaea.de>.

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Global Change Research in Mountain Regions

PONTRESINA, SWITZERLAND, APRIL 15-19, 1998

Mountain regions worldwide present a set of unique challenges and opportunities for the study of past and future global climatic and environmental change. An exciting new potential IGBP inter-core project on Mountain research is currently taking shape. Several documents highlighting the mountain research agenda have recently been published. IGBP report 43, "Predicting Global Change Impacts on Mountain Hydrology and Ecology: Integrated Catchment Hydrology/Alti-

tudinal Gradient Studies", documents the results of an international workshop held in Kathmandu, Nepal in April 1996. Initial development of this document arose primarily from the combined interests of BAHC and GCTE with some input from LUCC and PAGES. The report was complemented by documents from two follow-up meetings: a LUCC Workshop on "Dynamics of Land Use/Land Cover Change in the Hindukush-Himalayas" in Kathmandu, Nepal (April 1997), and the "European Conference on Environmental and Societal Change in Mountain Regions" in Oxford, UK (December 1997).

At the Pontresina workshop, a small group of about a dozen scientists, including representatives from all four of the above IGBP core project communities gathered to discuss implementation of a mountain workplan. The outcome of these discussions, taking the above publications as a starting point, is envisioned to be a clear set of tasks to be solved and proposals for action that will provide guidance for coordinated mountain research around the globe. In order to provide a truly global view, complementary monitoring efforts are required in all different types of mountain regions around the globe including polar regions, temperate zones and the tropics, coastal regions and dry continental interiors. PAGES has a well developed suite of mountain research projects reconstructing both climate and ecosystem change along altitudinal gradients spanning each of the PEP transects. Participating in this ongoing mountain research coordination effort could provide a mechanism for comparison amongst all of the latitudinal PEP transects along a "vertical transect." In addition, PAGES input into any new climate and ecosystem monitoring efforts which may arise out of this initiative could ensure that present day monitoring complements, both geographically and thematically, ongoing efforts in paleoreconstruction.

Any PAGES scientists interested in taking the lead in formulating potential PAGES participation in this project should contact Keith Alverson at the pages IPO (contact below). Further information and copies of the European Conference report on Global Change in the Mountains are available from Martin Price (martin.price@ecu.ox.ac.uk) Copies of IGBP report 43 are available on request from the IGBP secretariat (<http://www.igbp.kva.se/>). Further information on the potential intercore project mountain initiative can be obtained from Harald Bugman (bugmann@ucar.edu) or Alfred Becker (becker@pik-potsdam.de).

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Calibration of Historical Data for Reconstruction of Climate Variations

BARCELONA, SPAIN, JULY 6-8, 1998

An international workshop titled, "Calibration of Historical Data for Reconstruction of Climate Variations" was held in Barcelona, Spain, on 6-8 July, 1998. The meeting attracted 22 participants from 12 countries. The aim of the conference was to focus attention on the availability of documentary materials containing high quality observations of weather and climate phenomena that could be used to reconstruct climatic variability prior to the availability of instrumental records.

Participants were asked to present talks on two major topics. The first major workshop theme dealt with calibration of the historical proxy record. That is, with the transformation of documentary written evidence (DE) about weather events and related phenomena into quantitative climatic indices. Sessions focused on the kinds of evidence available, weaknesses and strengths, temporal and spatial resolution, accessibility, etc., with emphasis on the development of extreme occurrences. A second major theme concerned the evaluation of time series of temperature and precipitation indices from DE, and comparison of DE-derived indices with other high resolution proxy data. That is, this latter focus was aimed at engaging in a discussion of methodological approaches to climatic reconstruction from DE and other proxy climate records, such as weighted and unweighted indices, cross-calibration, validation and some verification approaches.

The broader context for this meeting was to: 1) discuss scientific questions regarding the calibration and use of historical DE and other high resolution proxies such as tree-ring records to reconstruct past climatic variability, 2) discuss results of climatic reconstructions based on these proxy records in the context of PAGES and WCRP goals of defining climatic variability for the last 2000 years, and 3) to encourage the development and use of centralized archives for paleoclimate data, such as the World Data Center system, for enabling greater access by the scientific community to original source material, as well as the calibrated climatic indices.

A key question addressed by the participants was the following: How well can critical elements of past climate—frequency of occurrence of past climatic extremes, such as, floods, droughts, storms, etc.—in the past 500 to 1000 years, be reconstructed from the available historical record, and with what certainty? In particular, the time and spatial synchronicity of major climatic episodes was recognized as an important goal of historical climate recon-

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