

meetings co-conveners David Anderson and Robin Webb with input from all of the attendees. The first part will primarily consist of a compendium of data centers within PAGES and in overlapping fields. The second part will present guidelines on how to set up a regional or topical data center. Although the document will be produced in hardcopy, available from the WDC-A in Boulder and the PAGES IPO in Bern, it will also be put on the PAGES and WDC-A Internet sites, where it will be maintained more dynamically and thus remain an invaluable research tool into the future.

For more information on the evolving PAGES Data Guide contact David Anderson (dma@paleosun.ngdc.noaa.gov) or look for updates on the PAGES and WDC-A web sites (<http://www.pages.unibe.ch/> and <http://www.ngdc.noaa.gov/paleo/paleo.html>).

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PEP1: Paleoclimate of the Americas

MÉRIDA, VENEZUELA, MARCH 16-20, 1998

Over seventy scientists from all over the world, studying paleoclimate from Argentina to Alaska, assembled to address interhemispheric linkages in past climatic and environmental change in the Americas. The meeting began with a session on the human dimensions of climate change, a topic well deserving of this prime time billing given that the Americas transect, and in particular the Andes region, has seen an intricate interplay of human habitation and environmental change for over ten thousand years. The rise and fall of pre-Colombian civilizations in coastal regions, lowlands and the Andes were measured alongside records of pollen assemblages, lake level reconstructions, volcanic history and levels of snow deposition on high altitude glaciers. The interplay of technological, economic and social changes with environment and climate did not end in the distant past. In more recent decades, urbanization and poverty have dramatically effected local ecosystems and at the same time led to increases in the human vulnerability to environmental change.

Discussion of Holocene climate variability in the Americas was understandably dominated by the influence of El-Niño, the signal of which was discussed in records as diverse as Andean lake levels, Galapagos corals, tree rings and historical accounts. In the late glacial session an issue which permeated many of the talks was synchronicity of the Younger Dryas.

A general consensus was reached that the term 'Younger Dryas' describes a European event and should not be forced upon the rich tapestry of climate variability which is being uncovered in the Americas like a square peg into a round hole. Interhemispheric comparisons of Greenland and Antarctic ice core records seemed to indicate that the temperature anomalies are out of phase, such that the Antarctic Cold Reversal coincided with the Allerod-Bolling warming and anomalous warmth in the Antarctic coincided with northern hemisphere cool periods associated with Dansgaard-Oeschger variability. Ocean data were presented which seemed to support these ice core results, in addition to suggesting perhaps a slight southern hemisphere lead. The monkey wrench thrown in this picture was the recent Taylor Dome record, from a coastal Antarctic site, which appears to match the Greenlandic and not the Antarctic pattern. Polynyas were suggested as one possible cause for this anomalous record. The full glacial session centered around re-evaluation of tropical temperature changes during the Last Glacial Maximum and the climatic effects of changes in the ocean thermohaline circulation.

A more detailed reporting of the PEP1 meeting will appear in a future PAGES newsletter. A limited number of extended abstract volumes and further information on PEP1 programs are available from Vera Markgraf (markgraf@spot.colorado.edu). The full meeting program can be found at <http://instaar.colorado.edu/misc/pep.html>.

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ScanTran

ROVANIEMI, FINLAND, MARCH 19-23, 1998

ScanTran is the name adopted for the IGBP high latitude terrestrial transect (Koch *et al.*, 1995) through Scandinavia and northern Europe. The workshop in Rovaniemi represented the third in a series of workshops leading to the development of the ScanTran Science Plan that will be submitted to IGBP later this year. The initial workshop in Høvik (April 1996) was organised by the Norwegian IGBP Committee; as a result of the positive response of participants in that workshop to the proposal to develop an integrated science plan for a Fennoscandian terrestrial transect a second workshop was organised. This second workshop, held in Trondheim (June 1996), developed a clear outline of the science plan for the transect, and produced a report (Heal *et al.*, 1997) identifying both the key features of the proposed transect and the foci for the proposed integrated research programme. The

Rovaniemi meeting was an open meeting to which a wide international audience of scientists and social scientists was invited. The objectives of the meeting were to inform this wider audience about ScanTran, to confirm in greater detail the objectives of the proposed long-term programme of research in order to produce the Science Plan for submission to IGBP, and to identify individuals who would carry forward the process of establishing ScanTran as a recognised IGBP high latitude transect.

Some 90 or so participants registered for the meeting. Although registration was strongly biased towards the terrestrial ecology (GCTE) community, other IGBP core projects were also clearly represented (BAHC, IGAC, PAGES). One session of the formal presentations to the meeting was dedicated to Past Changes, with a keynote presentation by Brian Huntley and Richard Bradshaw that explored some of the key evidence of Holocene environmental and ecological changes in the ScanTran region, and an invited presentation by Matti Eronen that discussed especially the dendroclimatological evidence for Holocene and recent climatic and other environmental changes in northern Fennoscandia. A series of offered papers then discussed a wide range of paleoenvironmental topics. One of the Working Groups during the workshop sessions also was dedicated to Past Changes; the report from this Working Group will form part of the report from the meeting as a whole that is due to be published later this year. This report also will include extended abstracts of the papers presented at the meeting.

The meeting recognised a number of important features of the region encompassed by ScanTran that give added strength to the proposed terrestrial transect study. Amongst these, the established network of research sites with field stations and infrastructure to support field research is a key asset. Similarly, the existence of a large body of existing knowledge that can underpin any new research initiatives is of very great value; such knowledge includes, in the PAGES context, data from ice cores, from sediments both of the surrounding ocean basins and of lacustrine basins in the region, from studies of peat deposits, from dendroclimatological investigations and from archaeological studies at sites within the region. The long-term presence of human populations in the region, and the records of their impacts both from archaeological studies and from research into their indigenous knowledge, are a special feature of this region that will differentiate ScanTran from the other IGBP high latitude transects. The complementary environmental gradients of latitude and continentality also are a special feature of this region. These

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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-