

WORKSHOP REPORTS

1st LBA Science Steering Committee meeting (Large scale Biosphere-Atmosphere experiment in Amazonia)

SAO JOSE DOS CAMPOS, MARCH 31ST - APRIL 2ND 1997

The key questions for LBA are:

- How does Amazonia currently function as a regional entity?
- How will changes in land use and climate affect the biological, chemical and physical functions of Amazonia, including the sustainability of development in the region and the influence of Amazonia on global climate?

The LBA is divided in six general areas:-

- Physical Climate (which currently included the paleoclimate studies);
- Carbon Storage and Exchange;
- Biogeochemistry;
- Atmospheric Chemistry;
- Land Surface Hydrology and Water Chemistry;
- Land Use and Land Cover .

The LBA has been endorsed by IGBP as the first Integrated Global Change Science Project. Paleoclimate and paleo-environment studies are definitively included in the LBA frame, linked questions are described in the LBA Integrated Science Plan, soon to be published:

1. What have been the patterns of climate change (precipitation and temperature) on millennial to century time-scales in the Amazon environment?
2. How will analogues of past conditions, which generally represent an average of climate during several decades, help to improve our understanding of large scale mechanisms? (e.g. similarities have been observed between some climate variations during the last 7,000 years and present-day El Nino events).
3. What is the relative importance of external forcing (e.g. changes in insolation, atmospheric CO₂, SST) vs internal mechanisms for Amazon paleo-situations?
4. What have been the impacts of extreme climate variations during the last millenia on Amazon environments (vegetation changes, fires, erosion).

A previous document (LBA scientific meeting) gave emphasis to lacustrine studies and sedimentological/palynological proxies. The new text also includes other methodologies such as: physical geography, fluvial geomorphology, biogeography of vertebrates, soils and soil organic content (¹³C, ¹⁴C, charcoal). Other South American records, including volcanic activity and Andean ice cap cores, must also be considered in our

analysis. In fact, any contribution toward these objectives and the overall objectives of LBA are relevant. For example, the discussions on paleo-studies during the SSC also focused on other contributions:

- high resolution sonic profiles (3.5 kHz) , which appear necessary for the study sites in alluvial plain;
- methods for providing a record of past seasonality (speleothems, tree rings, laminated lacustrine sediment).

Operations and funding are now better defined:

- a US contribution from NASA, mainly dedicated to atmospheric studies, but also considering ecological research (a research announcement has been made) and hydrology / biogeochemistry.
- an EU contribution, to be defined during a European LBA-Workshop, in June-July. This last one, included in the G7 Pilot Project, is dedicated only to Brazil.
- a Brazilian consortium, to be created, including three agencies (FINEP, FAPESP, CNPQ)
- other contributions are from IAI and some European projects.

From an operational point of view, the European funding is, for the moment, restricted to Brazilian sites. For paleo-studies it may offer opportunities for European research in cooperation with Brazilian Institution, but many important EU contributions in other Amazonian countries have to be included in further projects. At the moment, specific research projects linked to the German Program SHIFT or to the French Program, from ORSTOM, AIMPACT, are capable of contributing to integration of the European LBA.

Many objectives of LBA paleo-studies cannot be restricted to Brazil or US or EU operations. One of the most important is the creation of a data bank of present-day pollen deposition, which is also an objective of the PAGES and GCTE Core Projects of IGBP. Such an objective requires full participation by all Amazonian palynologists, in conjunction with Botanists, Climatologists and Statisticians. An effort must then be made, by the scientific community, for the integration of research funded by different countries (Brazil, USA, EU).

The sites for paleo-environment and paleo-climate studies should be, if possible, close to the LBA study sites (where all other researches are centered). The sites chosen dur-

Spatial-Temporal Dimensions of High-Latitude Ecosystem Changes

KRASNOYARSK, RUSSIA, SEPTEMBER 2-7, 1997

The Institute of Forestry, Krasnoyarsk, recently hosted a workshop on "Spatial-Temporal Dimensions of High-Latitude Ecosystem Changes" as a contribution to the development of the IGBP North Siberian Transect. PAGES was represented by expertise in dendro-climatology (notably Keith Briffa, University of East Anglia and Malcolm Hughes, University of Arizona, in addition to members of the Forestry Institute under Eugene Vaganov's leadership) and in peat and sediment studies. The programme included an excursion to contrasted forest sites in the region and a wide range of scientific presentations and discussions. Recognition of the vital role of 'dendro-research' in establishing fire histories, the nature of disturbance regimes and forest stand dynamics at the patch scale, as well as in providing high resolution paleoclimatic information and estimates of changing

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ing this SSC meeting were Rondonia , Sao Gabriel da Cachoeira, Tefe (Mamiraua), Manaus, Santarem, Maraba and Brasilia, this last one representing the extra-Amazonia reference site. For neighbouring countries, some sites have been cited:

- Noel Kempf Reserve (NE Bolivia),
- Sao Carlos do Rio Negro (Venezuela),
- Puerto Maldonado (Peru),
- Napo Valley (Equador),
- Leticia and Araracuara (Colombia).

In the physical climate realm, comparisons may be made on a larger space scale, Amazonia climate variations should be compared with extra-tropical records.

My final consideration would be that a clear call has been made by the LBA, to the paleo-community. This is an excellent opportunity to demonstrate the utility of paleo-environmental reconstructions for a better understanding of the current and future behavior of environmental systems. This regional approach provides a favourable opportunity to put different fields of science in contact with each other.

BRUNO TURCO

ORSTOM-UFF

Departamento de Geoquimica

Morro do Valonguinho s/n, 24020-007

Niteroi, Brazil

e-mail: Geoturc@vm.uff.br

Land Use and Land Cover Change (LUCC) / IGBP-DIS Data Requirements Workshop

BARCELONA, SPAIN, NOVEMBER 11-14, 1997

PAGES presentations were made by Suzanne Leroy and Frank Oldfield

biomass, was one of the clear highlights of the meeting. Carbon sequestration in boreal ecosystems was a major linking theme of the workshop and the complementary roles of forest, soil and peat studies were emphasized. The potential role of peat, hydromorphic soil and lake sediment studies in reconstructing not only past vegetation and forest dynamics but also mineral flux, within defined watershed-ecosystems, was accepted as a component of the implementation plan for the transect. The environmental context provided by the North Siberian transect is rich in paleo-archives and is one where there is every opportunity for PAGES science to interact with other parts of IGBP, notably GCTE and BAHC.

The meeting also gave an opportunity for the assembled scientists to celebrate the honour recently achieved by one of the retiring PAGES Scientific Steering Committee members, and Director of the Institute of Forestry, Dr. Eugene Vaganov, namely his election as an Academician.

FRANK OLDFIELD

Executive Director

PAGES IPO

e-mail: frank.oldfield@pages.unibe.ch

C-T. A. Chen and T. Hama awarded Biwako Prize

The Biwako Prize for Ecology was founded by the Shiga Prefectural Government of Japan in 1991 in the hope of contributing to the progress of aquatic environment studies in the fields of limnology, oceanography, ecology and related sciences. Biwako means 'Lake Biwa', the largest lake in Japan and the third oldest in the world. Each year a certificate of merit and five million Japanese yen (about \$ 40,000 US) are awarded to two researchers chosen by the Shiga Prefectural Government and the International Lake Environment Committee.

This year recipients were Dr. Chen-Tung Arthur Chen of the Institute of Marine Geology and Chemistry, National Sun Yat-sen University, Taiwan and Dr. Takeo Hama of Nagoya University, Japan.

Dr Chen was noted for his research related to the oceanic CO₂ problem and PAGES related work in the lacustrine environment in Taiwan. Dr. Hama was noted for his research on primary productivity in the oceans.

The importance of studying long term records of land-use/land-cover (LU-LC) change was acknowledged at the meeting. One goal shared by LUCC and PAGES will be to document, by all available means, the history of LU-LC change over the last 200 years. This is in accordance with the views expressed more widely at the IGBP Congress in 1996. The spatial cover will ideally be global, though regional disparities in data are recognised as a significant limitation for some parts of the world. In order to achieve this initial goal, it will be necessary to generate a common commitment between interested groups in LUCC and PAGES, which, in turn, implies developing the initiative in ways that can generate mutual benefits to both communities.

As a first step, it was proposed to hold a small workshop (10-12 people) with, as its proposed title:

"Historical Dynamics of Land Use, AD 1800 to 1997"

The main aims of this would be to:

- define and start to establish a collaborative community willing and able to carry the initiative forward;
- address, as required, the question of data calibration with respect to fully documented LU-LC categories at the present day and in the recent past;
- define and promote rationales for the initiative that would attract broad support and participation;
- create classification schemes directly linked to LUCC activities and priorities;
- resolve issues of spatial scale and temporal resolution;
- establish guidelines for regional and methodological contributions and for harmonising these to create a global data set;
- identify and build on existing data sets.

The likely participants in such an initiative are quite diverse, as are the types of data they use and the insights they can provide. They include, for example, pollen analysts, historical geographers, environmental historians, dendro-ecologists and landscape ecologists. Harmonising the interests, skills and data output of such a disparate group is a non-trivial task.

The most practical product of the initiative would be a spatially referenced data base from which a series of time-slice maps, for example,

could be generated at any stage and refined as the project progressed.

It was suggested that DIS, LUCC, PAGES, GAIM and GCTE were all potential participants from within IGBP.

Any members of the PAGES community who are interested in taking part in such an initiative should contact the Project Office.

Other PAGES-related themes that were considered included:

- the need for longer term perspectives, especially in ecosystems like forests, where successional/competitive processes took place over longer periods of time. In such cases, biophysical feedbacks, species composition and ecosystem structure and function may change on relatively long time scales and a perspective from 200 to 1000 years was considered desirable;
- the importance of studies documenting non-reversible human impact on fragile ecosystems in the past;
- the need to include a well articulated historical dimension in regional case studies of special significance to LUCC;
- the value of exploring the impact of natural climate variability on LU-LC.

FRANK OLDFIELD

Executive Director

PAGES IPO

e-mail: frank.oldfield@pages.unibe.ch



PAGES International Project Office
Bärenplatz 2
CH-3011 Bern, Switzerland
Tel: +41 31 312 3133
Fax: +41 31 312 3168
e-mail: pages@pages.unibe.ch
http://www.pages.unibe.ch/

Executive Officer: Frank Oldfield
Director: Bruno Messerli
Scientific Assistant: Keith Alverson
Office Manager: Niklaus Schranz
Publication Officer: Cindy Jones

Newsletter Editor: Frank Oldfield

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