

WORKSHOP REPORTS

stable isotope signals which are being calibrated to the instrumental meteorological record. This calibration is being used to resolve major precipitation events and temperature fluctuations.

Examination of the ice sheet record between ice core sites

Ice cores can provide annually resolved records of environmental change but they are based on centimeter scale diameter samples. Snow and ice radar systems on the other hand provide detailed information that can be tuned to investigate snow layering in the upper several tens of meters of the Antarctic ice sheet and down to thousands of meters in depth to detect ice thickness and bedrock configuration. Radar measurements between and around ice core sites add information that is extremely valuable in assessing the representativeness of ice core sites and in the determination of decadal averaged snow layer thicknesses between core sites. Detailed examination of changes in topography and ice dynamics that exert controls on accumulation rate are being conducted through GPS surveys along ITASE traverse routes in order to remove the influence of these factors and more clearly assess the influence of climate change on accumulation.

Ground truth for satellite remote sensing of the Antarctic ice sheet

Recent advances in remote sensing technology and availability of images has vastly improved traverse route selections, core site selection and spatial interpolation of ice core time series. As an example, temporal changes in snow surface elevation and velocity can be mapped using laser altimetry and interferometric methods. ITASE traverses provide unique opportunities for developing ground truthing for remote sensing experiments that are geared toward characterizing and interpreting changes in surface topography, surface temperature, surface velocity and various other surface characteristics of ice sheets (roughness, grain size, albedo).

Future of ITASE

The workshop also provided a venue for discussing the coordination of sample collection, sample handling, data exchange, data interpretation and future ITASE oversnow traverse plans

for the next decade. ITASE efforts over the next decade are widely dispersed over the continent. Themes to be investigated by current and future ITASE investigations include:

- (1) Relationship between Antarctic precipitation variability and ENSO associated climate, particularly, precipitation variability in Southern Australia and perhaps South America.
- (2) Variations in cyclogenesis, storm tracks, moisture flux and the strength of the low pressure cells that surround Antarctica.
- (3) Interannual and decadal variability in sea ice extent and concentration,

persistence and maintenance of coastal 'latent heat' polynyas.

- (4) Changes in the chemistry of the atmosphere over Antarctica and differentiation of natural versus anthropogenic controls on such change.

Working group reports from the meeting, related references, descriptions of the research presented and the ITASE Science and Implementation Plan (Mayewski and Goodwin, 1997) are available at www.antcrc.utas.edu.au/scar/itase.html.

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Conference on Marine Environment: the Past, Present and Future

KAOHSIUNG, TAIWAN, 26–28 JANUARY, 1999

The Conference on Marine Environment: the Past, Present and Future was the result of a series of consultations with a number of international scientific organizations (JGOFS, LOICZ, PAGES and START) as well as individual scientists. It was hoped that such a conference would provide a forum that would result in lucid, candid descriptions of the status of the marine environment. Further, experiences learned from past environmental changes were deemed useful in order to ameliorate the fast growing environmental ills that face the oceans today.

The conference was organized into several themes each with two or more sessions related to JGOFS, LOICZ and PAGES. Four sessions were devoted to the "Marine Environment, the Past" with 16 oral presentations and 4 posters. These were mostly related to the Western Pacific Warm Pool. For example, the warm pool in the eastern Indian Ocean during the last 30,000 years was discussed by P. de Deckker, during the last glacial maximum by R.J.I. Martinez, and in the Sulu Sea over the past 140 kyr by B.K. Linsley. H. Kawahata reported on the fluctuations in material transport during the late Pleistocene, and E. Matsumoto reconstructed the climate patterns of recent centuries in the Kuroshio region on the basis of corals.

M. Yoshino reported on paleomonsoon circulation in East Asia in the period of 18,000–20,000 B.P. M.Y. Oba described surface temperature off the eastern coast of Japan during the last glacial maximum.

The second major topic centered on the South China Sea. K.Y. Wei, M.T. Chen, T.Q. Lee, C.Y. Huang, E.F. Yu and L.W. Wang discussed such areas as paleotemperature, paleomonsoon and paleoproductivity, mostly based on IMAGES cores. G.J. Wei spoke about Mg/Ca and Sr/Ca coral thermometry. H.C. Lan compared the paleomonsoon records of Inner Mongolia and the South China Sea. On a larger scale Y. Ono presented the synchronicity of rapid climatic changes in Monsoon Asia. J.D. Ortiz presented the application of non-invasive methods to sediments collected from Western Pacific marginal seas. S.R. Troelstra introduced a global perspective of the conveyor belt. Finally, Z.X. Liu reported on Quaternary seismic stratigraphy in the East China Sea shelf, and Y.C. Chen discussed coccolith in the ocean environment.

After these presentations a special Workshop on the Western Pacific Margins was organized by M.T. Chen and P. de Deckker. The working group was initiated and approved in the IMAGES

SciCom meeting held in San Francisco in December 1996. The motivation of forming this working group was to better coordinate and promote all scientific activities on high-resolution late Quaternary paleoceanography of the western Pacific marginal seas (from the Bering to the Tasman Seas), and to better exchange information on paleoenvironmental and paleoclimatic records from the western Pacific covering the last 300,000 years.

The goal of this particular workshop was to establish a partnership that would significantly enhance data sharing and access, essential to the understanding of key issues of the western Pacific and Asian environmental variability. More specifically, the WEPAMA working group meeting was aimed at providing an important incentive to the development of future giant piston coring programs using the French vessel *Marion Dufresne* in the western Pacific marginal seas. Workshop participants included representatives of major members in the IMAGES program from the US, France, the Netherlands, Japan, Australia, Colombia, China, and Taiwan.

The meeting began with an introduction to the background of the IMAGES program, followed by discussions on scientific questions of the western Pacific paleoceanography: I. East Asia Paleomonsoons; II. Western Pacific Warm Pool Variability; III. SST and Circulation Patterns Since the Last Glaciation; IV. Land-Sea Paleoclimatic Linkage; and V. New Techniques and Proxies. The working group identified approximately 30 potentially good sites for giant piston coring in future IMAGES cruises in the year of 2001, and proposed the schedule for the next meeting.

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Paleohydrology and Paleoclimate as Reflected in Lake-level Changes in China

NANJING, CHINA, 26–29 APRIL, 1999

About 40 geologists, geomorphologists, chronologists, palynologists, paleoclimatologists, and paleo-GCM experts from China, Germany, Australia, the USA, and the UK attended this international workshop with support and sponsorship from the National Natural Science Foundation of China, the Chinese Academy of Science and the Max-Planck-Institute for Biogeochemistry, Germany. The workshop was convened with the twin aims of building up the existing Chinese Lake Status Data Base (CLSDB), as a contribution to the International Global Lake Status Data Base records (GLSDB) program, and taking the first steps towards investigating the comparison of climate reconstruction based on Chinese lake records with climate model simulations. The effort is a contribution to the PMIP program, in which coupled-ocean simulations are being conducted by several groups, including scientists associated with the Testing Earth System Models with Paleoenvironmental Observations project (TEMPO).

The presentations and discussion began with reviews of recent advances in paleo-monsoon reconstructions mainly based on lake records, with "Recent research on the Asian paleomonsoon" (An Zhisheng), "High lake level records and enhanced Asian monsoon during 30–40 ka in Tibet" (Shi Yafeng), "Paleoclimate and Africa-Asian monsoon" (Sandy Harrison), "Paleomonsoon records from Australia" (Liz Pickett). There were also several database demonstrations including "A range of paleo-data bases, in the PAGES PEP II region and the paleomonsoon" (John Dodson), "Potential Global Lake Status Data Base" (Philipp Hoelzmann), and "The state-of-the art of Chinese Lake Status Data Base" (Ge Yu). Modeling presentations included "Climate simulations, including Paleoclimate modelling for 6 ka and 21 ka" (Paul Valdes), "Paleohydrology modelling in Western China since 126 ka" (Mike Coe) and "PMIP-paleoclimate data and modeling comparisons" (Sandy Harrison).

There was a series of reports on regional lake sedimentology, paleohydrology and paleoclimate and demonstrations of ongoing lake research from the Tibetan Plateau and inland Xinjiang (Li Shijie, Li Binyuan, Wang Fubao, Zheng Mianping, Tang Lingyu, Li Shengfeng), Inner Mongolian Plateau (Xiao Jule, Shen Ji), the Yunnan Plateau (Xue Bin, Zhang Zhenke) and eastern parts of China (Xu Qin Hai, Yang Dayuan, Guo Shengqiao, Wang Jian, Xiao Jiayu). The lake sedimentary records presented were mostly from the Holocene but many lakes from western China have records extending beyond the last glacial maximum, to 30–40 ka BP (Figure 1). Numerous geomorphologic investigations of these lakes show evidence of high stands and absolute lake levels in the past. Changes in lake status have been reconstructed on the basis of changes in lithology, geochemistry, geobiology and archaeology. The chronology for changes in lake status is based on radiocarbon dates, thermo-luminescence dates, and paleomagnetic and stratigraphical correlations. All have produced compelling evidence for major climatic variability across eastern Asia's monsoonal regions. There were very high lake-levels in Tibet at the start of the period 30–40 ka BP, and we know that conditions on the eastern plains of China during the LGM were very dry. Many lake level changes are nearly synchronous over China during the mid-Holocene. A few of the talks dealt with changes in fluvial systems in China, such as the extremely large flood events recorded in the channel forms of the Huanghe River (Yellow River) in the Holocene. Bin Xue and Ge Yu also reported on their recent work on the CLSDB lake status coding and documentation procedures during the workshop.

The workshop culminated in a provisional agreement to continue work towards the establishment of CLSDB. One of the first goals for the CLSDB is to create a database of lake status records spanning the last 30,000 yr BP. Addi-