

## The Chinese Maar Drilling Programme A Chinese–German Cooperation for Paleoclimatic Reconstructions

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Over the last ten years, interest in high resolution (decadal to annual) paleoclimatic studies has grown rapidly. The climate system contains numerous processes on subdecadal time scales, for example the “North Atlantic Oscillation” (NAO) and the “El Niño–Southern Oscillation” (ENSO). In order to capture such modes, it is necessary to investigate paleoclimate with annual resolution. A broad range of high resolution paleoclimatic records with annual or subannual resolution (e. g. ice cores, corals, and tree rings) are available for the late Holocene. Further back in time the records are scarce.

In contrast, continental records of annual to seasonal resolution are available in maar lakes as far back as 101 ky (Lago Grande di Monticchio, Italy, Allen et al., 1999, Brauer et al., 2000). Even large lakes can contain excellently varved records (Ken-Tor et al., 2001). The Chinese Maar Drilling Programme was established in order to target these records in East Asia. To date, coring campaigns have been organized in south and northeast China (Project I & II, Figure 1).

The Huguang Maar record from South China documents the last 78,000 years. Unfortunately, this paleorecord was not varved but it was none the less possible to establish an age model based on AMS<sup>14</sup>C data and high resolution paleomagnetic measurements. The chronology is sufficiently robust to allow comparison with the marine sequence of Blake Outer Ridge (Nowaczyk et al., 2000).

Figure 2 reveals the climate change reconstructed in this record since Marine Isotope Stage (MIS) 5a. The Younger Dryas is marked by a peak in inorganic carbon and smaller amounts of organic carbon (Mingram et al., 2001).

Initial short and freeze cores in Sihailongwan maar in Northeast China provide an annually resolved re-



Fig. 1. The Chinese Maar Drilling Programme. Maars and volcanic fields in China and map and picture of Huguang Maar Lake.

cord covering the last Millennium. Pollen records show no indication of a Little Ice Age.

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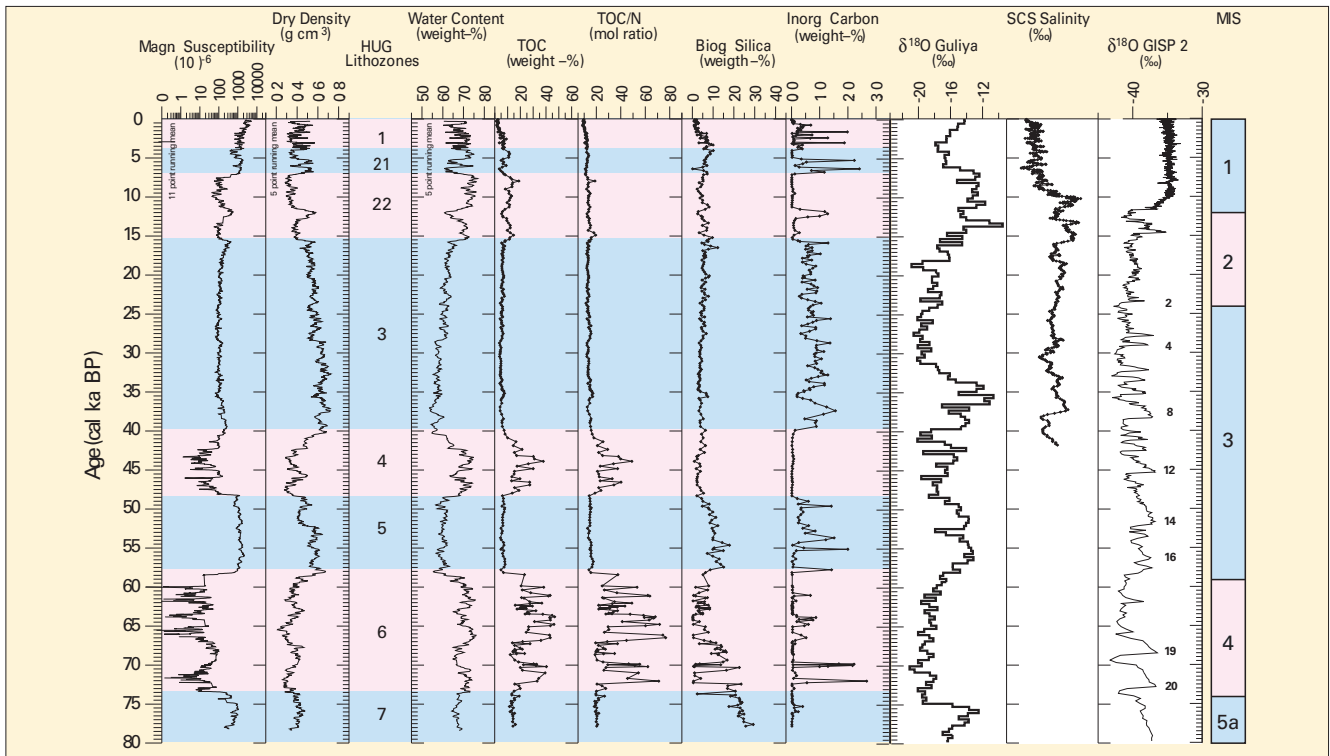


Fig. 2. Comparison of lake sediment data from Huguang Maar, ice core data from Guliya Ice Cap (Thompson et al., 1997) and Greenland (NOAA-Greenland Ice Core CD-ROM), and sea surface salinity data from the South China Sea (Wang et al., 1999).

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For full references please consult: [www.pages-igbp.org/products/newsletter/ref20012.html](http://www.pages-igbp.org/products/newsletter/ref20012.html)



## Pollen Records of the Last Glacial Cycle in the Southern Hemisphere Tropics of the PEP II Transect

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There is increasing interest in the role of the tropics, especially the maritime continent at region centred on Indonesia, in the search for a fuller understanding of global climate change. In addition to its importance as the 'boiler-box of the world', this region is a major player in both El Niño–Southern Oscillation (ENSO) variability and the Asian-Australian summer monsoon system. The critical location of the region in relation to the Indonesian Throughflow section of the thermo-haline conveyor belt provides it with the potential to alter

both atmospheric and oceanic global circulation systems.

Due to perceived difficulties in working within lowland humid ecosystems, it is only recently that intensive and sustained research has been undertaken on the region as a whole. The potential for continuous, high resolution palaeoecological records from an abundance of sediment-filled volcanic craters on land and deep troughs between the many island systems is enormous. These sites allow comparison between environments on land and in the ocean and, in the case of pollen, comparison

of local and regional vegetation histories with good chronological control provided by oxygen isotope data from the ocean records.

Summary pollen records from paired terrestrial and marine sites in Indonesia and northeastern Australia for the last glacial cycle are shown in Figure 1. These represent four of the seven long pollen records covering the last one to three glacial cycles prepared from this region to date (Figure 2). The West Java record is a compilation of the lower montane diagram from the Bandung Basin (van der Kaars and Dam 1995) with the LGM and Holocene filled in by