

Large Lake Records and New Perspectives for Continental Paleoclimate Archives

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Related to the need to improve our understanding of global paleoclimate patterns and their forcing, there has been a growing interest within the paleoclimate community in linking marine and terrestrial records. While the last decades have seen an immense effort by the whole paleoceanographic community in recovery and study of marine records, the terrestrial community has only recently begun to coordinate such a concerted effort (see PAGES Workshop Report 96-4: Continental Drilling for Paleoclimate Records). To take inventory of the geographical range and types of paleoclimatic information that can be obtained from long lacustrine sedimentary records, D. Ariztegui, V. Markgraf and P. Baker convened a session on "Large Lake Records and New Perspectives for Continental Paleoclimate Archives" at the AGU Fall Meeting 1998 in San Francisco.

Thirty-eight oral and poster presentations illustrated both the level of activity world-wide in the recovery and study of long lacustrine sediment records, as well as the extent of interest in that research. Presentations dealt with paleolimnological and paleoclimate results from studies of lacustrine sequences from essentially every continent, including Antarctica, from the Quaternary to the Permian. A large variety of geophysical, neo- and paleolimnological methods, many of them

comparable to paleoceanographic methods, were discussed. Results were shown from ongoing pioneering projects in South America (Patagonian lakes, Lake Titicaca), east Africa (Rift lakes), Kyrgyzstan (Lake Issyk Kul) and Siberia (Elgygytyn Crater). New insights into long-term paleoclimate change comprising several glacial-interglacial cycles were presented by multidisciplinary projects in North America (Coastal Alaska, Lake Winnipeg, Laurentide Great Lakes, Great Salt Lake, Owens Lake, Lake Estancia, Guatemalan lakes), Asia (Lake Baikal, Qinghai Lake, Lake Biwa, Dead Sea) and Europe (Lake Constance, Lake Steisslingen, lakes in southern Sweden). From all the different studies presented it became apparent that every lake system presents its own challenges in terms of chronology, presence of climate proxies (geophysical, geochemical and biological) and limnological and regional climate implications. Development of new proxies and their paleoclimate potential is therefore an important aspect in most of these studies. Some of the new advances in the analysis of lake sediments for paleoclimate reconstruction worth mentioning include: using $\delta^{15}\text{N}$ as a tracer for variations in salmon abundance, sulphur isotopes in gypsum and redox-sensitive metals and image analysis to quantify sedimentary observations from thin-sections. In this context



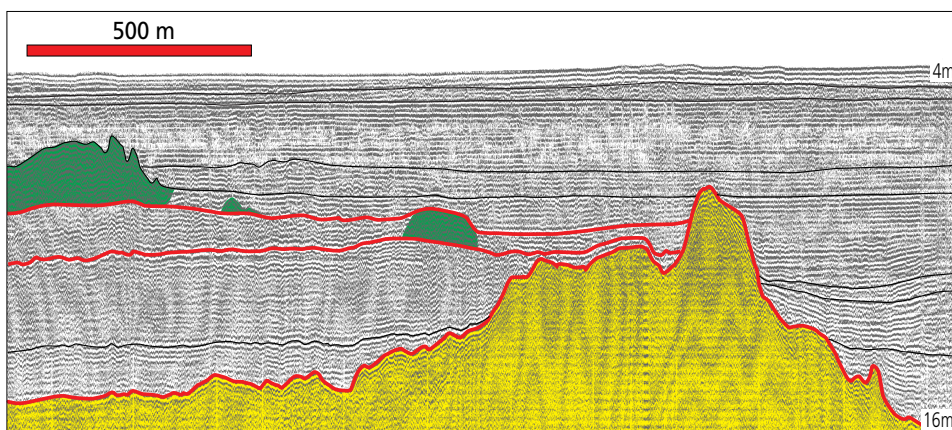
Acquisition of high-resolution seismic data on Lago Cardiel (49°S). (Figures provided by the Limnogeology Laboratory, ETH Zürich, Switzerland).

the crucial importance of modern calibration studies was also stressed, and presentation included analysis of $\delta^{18}\text{O}$ in cellulose of aquatic algae and water plants in tropical lakes and of ostracode species in Patagonia. Another conclusion from the presentations was the importance of high resolution and multi-disciplinary studies in order to obtain more accurate and realistic paleoclimatic reconstructions.

Finally, recent advances on the Global Lake Drilling (GLAD800) initiative were presented by K. Kelts, S. Colman, T. Johnson and I. McGregor (NSF Continental Drilling Program). The proposed facility, including coring platform and coring devices, is conceived to obtain high-quality undisturbed sediment cores, and would be available for all NSF or International Continental Scientific Drilling Programme (ICDP) projects around the world and represent an important step towards the development of a global network of long continental records (for more details see next page).

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Within the framework of PEP I, two closed basin lakes in Southern Patagonia were surveyed in January 1998 by an international team of researchers. Evidence of dramatic lake level lowstands are clearly recognized in this seismic profile of Lago Cari-Laufquen (41°S). Red lines mark seismic reflections that indicate times of very shallow lake levels or even subaerial exposure.

Erratum

The report on the SEA Dendro Workshop in PAGES newsletter 98-2 was missing two acknowledgements. The tree ring climate reconstruction figure was from Hemant Borgaonkar and Brendan Buckley was a co-author of the article.