Preface

There is a general increase in the awareness of political, business and financial institutions for the necessity of concrete action to allow sustainable development in mountain regions. This increased interest in mountain regions is documented by the resolution of the UN General Assembly that declared 2002 the International Year of Mountains.

The world's mountains clearly do not lend themselves to a simple definition because of their complexity. For each region, specific characterisation is necessary. The Arctic and Alpine regions of Europe often represent the most remote and least disturbed natural environments; yet they are threatened by acid deposition, toxic air pollutants and by climate change. These environments are fragile, being subject to adverse and harsh climatic conditions (high levels of precipitation, low temperatures, aridity, high solar radiation), natural disasters (avalanches, earthquakes, volcanic eruptions), and poor, shallow soils prone to erosion because of steep slopes. However, the fragility of mountain ecosystems means that they are not only vulnerable to environmental change, but that they are also excellent sensors of change. Their sensitivity and the presence of high quality environmental records preserved in lake sediments can be used to infer the speed, direction and biological impact of changing air quality and climate.

As stated in Chapter 13 (Sustainable Mountain Development) of Agenda adopted at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro 1992, one of the main topics is the lack of specific knowledge of mountain ecosystems. It is therefore the aim of this special issue of Journal of Limnology to contribute to a global mountain database, a vital resource to support further programmes that contribute to the sustainable development of mountain ecosystems.

The results presented here were obtained during the EU-funded MOLAR programme, specifically the sub-project dealing with "Climatic variability and ecosystem dynamics at remote mountain lakes". The main aims of this work-package were to: (i) correlate records of weather pattern over the last 200 y between lowland meteorological station and montane sites; (2) establish long-term variability in ecosystem dynamics from recent paleolimnological records and; (3) compare the reconstructed instrumental weather pattern with the variability of the paleolimnological records. The papers that have been included in this special volume have the aim of tracing ecosystem variability at these remote sites. Whilst in a subsequent issue of the Journal of Paleolimnology which is currently in preparation, the results of the comparison of meteorological patterns with the paleolimnolgical result will be discussed.

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