

Editorial

## Holocene climate variability—a marine perspective

Future climate change will be occurring as a combination of natural climate variability and responses to anthropogenic forcing factors. It is thus necessary to understand the natural element of climate variability to assess our climatic future. This has led to a strong interest in the climate dynamics community to improve our knowledge of the climatic evolution of the Holocene. In the IMAGES program, which is the marine leg of the Past Global Changes (PAGES), this led to the establishment of a specific working group for Holocene climate variability emphasising the marine paleoclimate record, and initiating studies and syntheses on the marine aspects of Holocene climate variability. One of the tasks of the working group is to coordinate meetings and workshops for such syntheses and to facilitate comparisons with results from other paleoclimatic disciplines and climate modelling on Holocene climates.

In this issue we have collected 14 contributions originating from the first workshop of the working group, held in August 2003 in Hafslo, Norway in a setting worthy of the subject. Historical and glaciological evidence from the fjord region nearby tell many stories of hardship encountered due to Holocene climate change.

The 14 contributions in this issue mainly comprise marine proxy reconstructions, but there are also papers summarizing evidence from continental archives, on forcing factors and climate model simulations, as well as on chronological issues. The breadth of the papers in this special edition of *Quaternary Science Reviews* will give the reader a broad perspective on recent research results and approaches, both on the record of climate change in low and high latitudes on regional and/or global scales, and also on the attribution of changes to external and internal forcing factors.

The marine records contain both globally oriented syntheses of the main trends of surface ocean characteristics during the Holocene and the response of the ocean/atmosphere system to the slow orbital forcing (e.g. Kim et al.), as well as a series of papers highlighting major advances obtained by the community in recent years in terms of providing records which document decadal to centennial climate change (e.g. Andersen et al., Giraudeau et al., Knudsen et al., Moros et al.). Papers address high latitudes, latitudinal gradients and the monsoon system. Schmidt et al. and Kim et al. provide modelling perspectives and Cook et al. and Nesje et al. highlight recent advances in continental records. The problem of establishing a chronological basis for correlation of Holocene records are addressed by Eiriksson et al. and Muscheler et al., stressing the need for improvements in an area of key importance. Schulz et al. also highlight an aspect of this by discussing the problems of attributing Holocene climate variability to internal or external mechanisms providing pacing of the variability at certain frequencies.

The collection of papers in this issue will be a good source of knowledge on recent developments in paleoceanography and paleoclimatology, and shows a community in strong progress both in terms of obtaining detailed records, as well as in understanding the scale of changes our planet experienced when human influence played a minor role.

Eystein Jansen  
Peter deMenocal  
Francis Grousset  
*University of Bergen, Allegaten 55,  
Bergen 5007, Norway*  
E-mail address: eystein.jansen@geo.uib.no