LATE HOLOCENE CLIMATE VARIABILITY AS RECORDED IN AN ISOLATION BASIN IN THE LÜTZOW HOLM BAY REGION, EAST ANTARCTICA

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The past two millennia are of particular interest to the understanding of the Earth's Climate System, because the boundary conditions of the climate did not change dramatically. The Northern Hemisphere (NH) climate is in that timeframe characterized by three main periods of climate change, namely the Medieval Warm Period (MWP; 1100-700 yr BP), the Little Ice Age (LIA; 500-100 yr BP) and the recent temperature increase. For the Southern Hemisphere (SH), the occurrence and timing of these climate anomalies are however less consistent (Verleyen *et al.*, in press), probably due to relative paucity of proxy data (Mann *et al.*, 2008). We aim to reconstruct climate variability during the past two millennia in the Lützow Holm Bay region, East Antarctica by means of a multi-proxy analysis on lake sediments. The distinct zones in the cores, based on diatom, pigment and lithostratigraphic analyses, correspond to a shift from marine to lacustrine conditions with a clear transition zone in between. These different environmental conditions provide information on coastal oceanographic conditions between 1975 and 1280 cal. yr BP, and on limnological conditions between 1155 cal. yr BP and present. The marine part of the sediment cores likely reflects ecological changes such as a declining water depth causing changes in light climate and sea ice dynamics as a result of lake isolation rather than climate variability. Between 640 and 560 cal. yr BP, the relatively higher chlorophyll and carotenoid concentrations and higher diatom productivity, are linked to a higher primary productivity and hence point to the presence of a warmer period. This warm period shows a delayed response by c. 150 years compared to the NH MWP, which confirms the simulations by Goosse *et al.* (2004). There is no evidence for a LIA-like event in this region, similar to previous findings in East Antarctica (Verleyen *et al.*, in press). The data from the upper centimeters of the core point to only very small direct and/or indirect changes in snowfall during the recent decades and are in agreement with a relatively modest warming in East Antarctica, probably related to a buffering effect of the ozone hole (Marshall *et al.*, 2009). We conclude that there still is a strong need for additional well-dated high-resolution records to test the apparent interhemispherical differences in paleoclimate variability.

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