



Inter-hemispheric Comparison of Mid-latitude Lacustrine Archives and High-latitude Ice Cores over the Younger Dryas and the Little Ice Age

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The ice-core records from Greenland and Antarctica provide some of the most suitable sequences to detect the onset of significant climate changes like the Younger Dryas (YD). In terms of inter-hemispheric comparison, the calibration of the age models is probably the most determinant parameter. In this context, the annual ice layers like in e.g. the GISP2 or Taylor Dome ice cores constitute important calibrated climate data for the assessment of the time responses between the northern and southern hemisphere. However, in order to fully understand the origin and the propagation of significant cold or warm events, it is necessary to include results from paleoclimate research from the mid-latitudes free of ice sheets. In this context the laminated lake sediments can provide long and continuous climate records that can be compared with the polar ice cores. Here, we compare calibrated lake sediment records from the mid-latitudes, i.e. in South America and Eurasia, to calibrated ice core records from Greenland and Antarctica. The age models are established by varve counting, ^{210}Pb , ^{137}Cs or ^{14}C data. Two time periods are investigated: the Termination I and the Last Millennium. The first time window includes the last cold event of the Pleistocene (i.e. the YD) and the second one, the most recent historic cold period (i.e. the Little Ice Age or LIA). A new chronology of the different inter-hemispheric climate responses is proposed over the two selected periods. Our new data show that the last cold event of the Pleistocene occurs 500 years earlier in the Southern Hemisphere. For the Last Millennium, the equivalent cold period of the LIA occurs ~ 80 years later in the Southern Hemisphere

than in the northern one. In the Southern Hemisphere, the LIA is characterised by an increase of the precipitation and the influence of El Nino. The time lag observed between the Northern and the Southern Hemisphere could be due to the occurrence of a local Late Medieval Warm Period (LMWP).