



Variability of Eurasian river discharges during the Holocene: potential influence on Arctic climate

A. Wagner (1,2), G. Lohmann(1) and M. Prange (2)

(1) Alfred Wegener Institute for Polar and Marine Research, Paleoclimatic Dynamics, Bremerhaven, Germany, (2) Geosciences Department, University of Bremen, Bremen, Germany

(Axel.Wagner@awi.de, Fax: +49(471)4831-1797, Phone: +49(471)4831-1845)

Arctic freshwater discharged by rivers plays a key role in the understanding of Arctic climate changes throughout the Holocene. As the amount of river water supplied to the Arctic Ocean is described as one of the most important driving forces for Arctic ocean circulation, its variability throughout the last 7 kyrs leads to a fundamental understanding of Arctic climate changes. Due to the lack of suitable observations, research activities analysing the hydrological cycle in the Arctic realm have been hampered. Numerical model simulations present an effective tool to extend and implement the observed data on a large-scale structure. Model runs have been carried out with the global atmosphere-ocean climate model ECHO-G. Numerical studies show that the freshwater supply delivered by Eurasian rivers is of vital importance to the Arctic oceanic circulation. A close correlation between the annual Eurasian river runoff and the pathway of the Transpolar Drift has been established which is consistent with paleo-oceanographic findings of driftwood. According the ECHO-G simulation, annual discharge patterns of Siberian rivers describe an increasing trend from the mid-Holocene until today, while air temperatures decrease owing to orbital forcing.