Geophysical Research Abstracts
Vol. 14, EGU2012-9198, 2012
EGU General Assembly 2012

Estimates of global ocean cooling at the Last Glacial Maximum based on sea-surface temperature and oxygen-isotope reconstructions

A Paul (1), S Mulitza (1), and M Losch (2)

(1) University of Bremen, MARUM - Center for Marine Environmental Sciences and Department of Geosciences, Bremen, Germany (apaul@marum.de), (2) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

The MARGO sea-surface temperature (SST) reconstruction for the Last Glacial Maximum (LGM, between 19,000 and 23,000 years before present) has been criticized to yield a low estimate of the fast-feedback climate sensitivity of less than 3 °C for a doubling of the atmospheric CO_2 concentration. We assess the reliability of this SST reconstruction using a global data set of ≈400 sea-surface oxygen isotope ($\delta^{18}O$) measurements on planktic foraminifera. Using objective interpolation, we show that for large regions and at the global scale the $\delta^{18}O$ measurements support the MARGO SST reconstruction. We discuss the sources of uncertainty (for example, the discrepancies among different proxies in the high-latitude North Atlantic Ocean and the influence of sea-ice cover) and why other ocean- as well as land-based reconstructions may arrive at larger glacial-to-interglacial temperature changes; and we comment on the implications for estimating climate sensitivity by combining temperature reconstructions for the LGM and climate models.