Geophysical Research Abstracts
Vol. 12, EGU2010-11053, 2010
EGU General Assembly 2010

Miocene climate simulations and the response of the marine carbon cycle

Martin Butzin (1,2), Gregor Knorr (2), Gerrit Lohmann (2,1), and Torsten Bickert (1)

(1) MARUM - Center for Environmental Sciences, University of Bremen, Bremen, Germany (e-mail: mbutzin@marum.de) ,
(2) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

The Miocene climate is characterized by a significantly reduced meridional temperature gradient which coincides with substantial changes of paleo-environmental conditions, like the uplift of major mountain ranges or changes of critical ocean seaways. However, so far climate simulations including tectonic forcing have not been able to reproduce the reconstructed meridional temperature gradient. This points to a broader modeling perspective of Cenozoic climates integrating further factors, such as varying greenhouse gas concentrations or land surface changes. Here, we apply the comprehensive earth system model COSMOS to an integrated time slice simulation of the Miocene. Special emphasis is placed on the response of the marine carbon cycle and the diagnosis of atmospheric carbon dioxide levels.