Geophysical Research Abstracts, Vol. 8, 04845, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04845

Pliocene sea surface temperature and the PRISM reconstruction

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The mid-Pliocene has been studied in great detail due to the fact that paleoclimate estimates indicate it was the most recent interval in Earth history with conditions considerably warmer than at present. In addition, many boundary conditions are nearly identical to the present day making it an attractive target for climate modeling activities. The U.S. Geological Survey began a systematic investigation of mid-Pliocene paleoenvironmental conditions nearly two decades ago with the goal of creating digital data sets that could be used to explore the behavior of climate models on conditions significantly warmer than at present. This project, Pliocene Research, Interpretation, and Synoptic Mapping (PRISM) has evolved into a collaborative effort with input from researchers and agencies around the world. The PRISM reconstruction has data sets for monthly sea surface temperature (SST), maximum and minimum probable SST, topography, vegetation, sea level, sea ice, and land ice. The SST data, based upon quantitative analyses of fossil foraminifers, diatoms, radiolarians, ostracods and mollusks, are at the core of the PRISM reconstruction.

The newest elements of the PRISM data include multiproxy SST comparisons and deep ocean temperature estimates. A history of the PRISM paleoenvironmental reconstruction with special emphasis on methods of SST estimation will be presented.