

The Community Earth System Model: Evaluation and CMIP5 simulations. Activities of the Paleoclimate Working Group

Bette Otto-Bliesner[†]; Fortunat Joos; Jeffrey Kiehl

[†] National Center for Atmospheric Research, USA

Leading author: ottobli@ucar.edu

The role of the CESM Paleoclimate Working Group is: (1) to identify paleoclimate simulations that will require large amounts of Climate Simulation Laboratory (CSL) computing time and/or are of broad interest to the community, (2) propose improvements to the models needed for paleoclimate applications, and (3) provide feedback to the CESM group based both on analyses of collaborative simulations done under the auspices of the working group and sensitivity simulations performed by individual researchers. In anticipation of the needs of the IPCC AR5 and other assessments, the Paleoclimate Working Group has completed the three paleoclimate simulations included in the CMIP5 long-term experiments for model evaluation and for understanding historical and paleoclimates. The experiments were also proposed by PMIP3 and include three key time periods: within Tier 1, the Last Glacial Maximum 21,000 years ago, and mid-Holocene 6,000 years ago, and for Tier 2, the Last Millennium from 850-1850AD. These three CMIP5 simulations were run with the standard 1-degree version of CESM-CCSM4, the same model version and same high resolution as the majority of the CCSM4 simulations for the 20th century and RCPs. In addition, the Last Millennium simulation has been extended through the 20th century to 2005, providing an additional 20th century ensemble member, but with initial conditions provided from the transient Last Millennium simulation rather than the long 1850 control simulation. Results will be presented from these three CMIP5/PMIP3 simulations as well as additional CCSM4 simulations for deep-time paleo periods: the Pliocene and the PETM.