Geoscientific Model Development
An interactive open-access journal of the European Geosciences Union

Geosci. Model Dev., 5, 289-297, 2012
www.geosci-model-dev.net/5/289/2012/
doi:10.5194/gmd-5-289-2012

09 Mar 2012

Set-up and preliminary results of mid-Pliocene climate simulations with CAM3.1

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Received: 08 November 2011 – Published in Geosci. Model Dev. Discuss.: 05 December 2011
Revised: 08 February 2012 – Accepted: 08 February 2012 – Published: 09 March 2012

Abstract. The mid-Pliocene warm period ~3.264 to 3.025 Ma) is a potential analogue for future climate under global warming.

In this study, we use an atmospheric general circulation model (AGCM) called CAM3.1 to simulate the mid-Pliocene climate with the PRISM3D boundary conditions. The simulations show that the global annual mean surface air temperature (SAT) increases by 2.0 °C in the mid-Pliocene compared with the pre-industrial temperature. The greatest warming occurs at high latitudes of both hemispheres, with little change in SAT at low latitudes. The equator-to-pole SAT gradient is reduced in the mid-Pliocene simulation. The annual mean precipitation is enhanced by 3.6% of the pre-industrial value. However, the changes in precipitation are greater at low latitudes than at high latitudes.

Citation: Yan, Q., Zhang, Z. S., Wang, H. J., Gao, Y. Q., and Zheng, W. P.: Set-up and preliminary results of mid-Pliocene climate simulations with CAM3.1, Geosci. Model Dev., 5, 289-297, doi:10.5194/gmd-5-289-2012, 2012.