Geophysical Research Abstracts, Vol. 9, 04868, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04868

Modeling the Climate Implications of the Messinian Desiccation

D. Kirk-Davidoff (1), L. Murphy (1), N. Mahowald (2) and B. Otto-Bliesner (2)
(1) University of Maryland (2) National Center for Atmospheric Research
(dankd@atmos.umd.edu)

During the Messinian Salinity Crisis (MSC), closure of the straits connecting the Mediterranean Sea with the Atlantic Ocean led to the evaporation of much of the Mediterranean, producing a subaereal depression with a depth of up to 2000 m, and a horizontal scale of thousands of kilometers. This unique event present a number of interesting questions that may be addressed using a sophisticated atmospheric general circulation model. How does the atmosphere feed back on the desiccation process? Do evaporation and precipitation depend significantly on sea-stand? If so, do these feedback processes substantially impact the time required for desiccation? What is the regional and remote impact of the atmospheric circulation changes forced by the change in Mediterranean sea level?

We will present detailed results from experiments using the NCAR Community Atmosphere Model (CAM3.1) configured with a Slab Ocean Model, in which the model is run to equilibrium with varying sea levels in the Mediterranean basin, and with complete desiccation. Precipitation responds strongly both the changes in sea stand and to the reduction in sea surface area as sea stand decreases. Besides the strong summertime warming in the desiccated basin itself, circulation changes in the surrounding regions result in significant warming and cooling patterns. In addition, we examine changes in storm paths in response to changes in large-scale synoptic circulation.