Geophysical Research Abstracts
Vol. 12, EGU2010-12140, 2010
EGU General Assembly 2010

The effect of seasonally varying optical properties of the Arabian Sea on SST biases and the Indian summer monsoon in a coupled GCM

Andrew Turner and Manoj Joshi
NCAS-Climate, University of Reading, Reading, United Kingdom (a.g.turner@rdg.ac.uk)

Cold sea-surface temperatures in the Arabian Sea during boreal winter and spring represent a common bias among state-of-the art coupled GCMs, potentially having a negative impact on subsequent Indian summer monsoon rainfall. Systematic model biases are often the result of poor or missing representations of physical, chemical or biological processes of the Earth System and low resolution. One such missing process may be the response of water to ocean biology. In this study we examine the effects of incorporating a parameterization of the seasonal cycle in chlorophyll due to phytoplankton blooms in the HadCM3 atmosphere-ocean GCM. This is achieved by varying simple optical properties of sea-water in the Arabian Sea in response to the ocean mixed layer depth, a key driver of the semi-annual cycle of phytoplankton blooms in the region. Sensitivity tests are also performed. In consequence, the Arabian Sea systematic cold bias is reduced. We also examine the impacts on the monsoon mean state and its variability.