



An Assessment of CCSM2 SST climatology over the northern Indian Ocean

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SSTs over the Northern Indian Ocean (NIO) play an important role in the air-sea interactions which in turn modulates the Indian Monsoon system. We study the seasonal cycle of SST and other upper oceanic parameters in the vicinity of the Indian sub-continent as simulated by the NCAR Community Climate System Model Version 2 (CCSM2). The seasonal cycle of various geophysical parameters simulated by the model is realistic but has a considerable bias vis-a-vis observations.

North Indian Ocean sea surface (especially the western part of NIO) is cooler by ~ 1.5 C over the entire annual cycle. We conduct a heat budget analysis of the oceanic mixed layer to study this cold bias in SST. We find that the annual cycle of SST in the Eastern Arabian Sea (EAS) and the Bay of Bengal (BOB) region are determined primarily by atmospheric processes whereas SSTs in Western Arabian Sea (WAS) both atmospheric and oceanic processes are equally important. We find model Mixed Layer Depth (MLD) are deeper (vis-a-vis observations) throughout NIO and this coupled with the large bias in evaporation flux (which is higher than observed) causes colder SSTs. The higher evaporative flux is related to higher winds in the atmospheric component (CAM2). The need to correctly simulate the coupled response of the ocean-atmosphere system will be highlighted