

Role of the Indian Ocean in Climate Variations Role of the Indian Ocean in Climate Variations

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The Indian Ocean gives rise to the well-known Indian Ocean Dipole (IOD) responsible for some of the extreme climate events in many parts of the world. For example, the extreme flooding events in East Africa and droughts in Australia are shown to be associated with the positive IODs. The impact was severe when in a rare turn of the history three positive dipole events evolved back to back during 2006, 2007 and 2008. However, after 2008, in the absence of positive IOD, several parts of East Africa suffered from severe draughts. In recent decades, the sea surface temperature of the tropical Indian Ocean has warmed leading to increased trade winds in the South Indian Ocean. Besides causing several changes in the southern and western Indian Ocean, the wind change has led to a warming in the Agulhas Current System. The stronger trade winds also have helped for the shoaling of the thermocline in the eastern tropical Indian Ocean. This has introduced favorable conditions for positive IOD formations. Considering these and their impacts on the regional climate, it has become an essential task to understand the characteristics of the Indian Ocean apparently related to changes in the background conditions under the global warming stress.

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