Present-day zonal wind influences projected Indian Ocean Dipole skewness

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A prominent feature of the Indian Ocean Dipole (IOD) is its positive skewness, where positive phases tend to be stronger in amplitude than the negative phase. Positive IOD events are associated with devastating floods over parts of East Africa and India whilst Australia and Indonesia experience dry conditions. Under greenhouse warming, climate models project a weakening of the positive IOD skewness but their simulation of present-day skewness is too weak. Here we show that this bias and the projected skewness change is related to the simulation of the climatological zonal wind in the central equatorial Indian Ocean. In particular, models with overly weak present-day westerlies, which is a common model bias, generate overly weak present-day skewness and a smaller projected reduction in skewness. Improving the ability of models in simulating stronger westerly winds may lead to stronger present-day simulated skewness and a larger skewness reduction in a warmer climate.

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