Why do Indian Ocean SST anomalies due to rainfall matter for El Nino predictions?

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A four-active-thermodynamic-layer-model of the Indian Ocean coupled to a quasi-equilibrium tropical atmosphere model is run forced by FSU winds over 1980-2000, in 2 different configurations for the rainfall forcing. One corresponds to climatological rainfall. The second is the rainfall simulated by the atmospheric model when the latter is forced by observed SST over 1980-2000. The analysis is focused on the period 1992-2000 which has two major events in 1994 and 1997 when the rainfall over the Indian warm pool (usually ~10 mm/day) almost drops to zero. In response to the anomalous equatorial easterlies blowing over the Indian Ocean during these events, the sea level off of Java drops by ~30cm according to TOPEX or the model. The difference between the two experiences is as little as 1 cm in sea level, but as big as 1 psu in salinity, 1.5 Degree C in sea surface temperature (SST). The atmospheric model shows that the SST changes of the Indian ocean have an impact on the local Indian atmosphere, and on the remote winds of the Pacific as well. In particular, the model simulates each year westerly wind bursts (WWB) in the western Pacific which have different characteristics in time and strength, depending on the presence or not of the Indian SST changes. Consequences on the El Nino predictions initiated in late 1996 are illustrated by testing the two different configurations of WWB in a tropical Pacific ocean model coupled to a statistical atmosphere.