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William R. Boos*, PO Box 208109, New Haven, CT 06520-8109. *Monsoons and the thermodynamic state of proximal deserts.*

Here we show that monsoon precipitation is influenced by the thermodynamic state of adjacent deserts, and provide an example of a relevant bias in the numerical models used to simulate next-century climate. We begin by examining observed monsoons in a convective quasi-equilibrium framework, in which near-surface entropy maxima are diagnostically related to the location and intensity of monsoon precipitation. Local entropy minima are located over adjacent deserts, and these minima covary interannually with monsoon precipitation. One exception is the South Asian monsoon, in which topography seems to insulate the thermal maximum from the influence of nearby deserts. But the smoothed topography used in almost all models participating in the Coupled Model Intercomparison Project allows too much desert air to penetrate the monsoon thermal maximum. This produces a negative bias in Indian monsoon precipitation in simulations of modern climate; increasing horizontal moisture gradients make this bias even stronger in simulations of next-century climate. This highlights the need for greater understanding of interactions between monsoons and adjacent deserts. (Received September 24, 2012)