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What advances monsoon onset over India?

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In the monsoon regions, atmospheric convection is typically stronger over the oceans than over land. Rainfall over land is potentially affected by the dynamic response of the atmosphere to deep convection over the adjacent oceans. Here, we show, in the case of the Indian summer monsoon, that enhanced atmospheric deep convection over the Bay of Bengal ~2 weeks before onset, advances monsoon onset over India. Since the sea surface temperature of the Bay of Bengal is already hot during spring, warm anomalies further enhance convection that drives a convergence of low-level winds. A part of this circulation response blows from central India to the Bay of Bengal. It paves the way for monsoon circulation over India and advances the onset of monsoon. We tested this hypothesis using an atmospheric model forcing it by warm sea surface temperature anomalies over the Bay of Bengal 10-15 days before monsoon onset.