

Moisture sources of summer precipitation over eastern China during 1979–2009: A Lagrangian transient simulation

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In this study, moisture sources for summer (June–July–August) precipitation over eastern China are investigated by performing a transient simulation for the period 1979–2009 using the Lagrangian particle dispersion model FLEXPART. The results show that the Indochinese Peninsula plus southern China, the South China Sea, the northwestern Pacific Ocean, the Asian continent, and the Bay of Bengal are major moisture source regions for summer precipitation over eastern China and that the moisture originated from eastern China, the Arabian Sea, and the Indian subcontinent has minor contributions. The contribution of the oceanic sources significantly surpasses that of the continental sources. The contributions of the various moisture source regions exhibited significant interannual variations during 1979–2009, especially the Indochinese Peninsula plus southern China, the South China Sea, the northwestern Pacific Ocean, the Asian continent, and the Bay of Bengal. Moreover, moisture sources have obvious monthly variations and seasonal cycle features, which are responsible for providing moisture for precipitation in the different stages of the monsoon over eastern China. In addition, it is revealed that a great amount of moisture for the slight precipitation over eastern China originates from the local and northwestern continental regions and eastern oceanic regions adjacent to eastern China, while more moisture comes from southwestern oceanic source regions and their adjacent continental regions for heavy precipitation.

Keywords: moisture source, precipitation, eastern China, FLEXPART

