



Spatial Scaling of Global Rainfall and Flood Extremes

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Floods associated with severe storms are a significant source of risk for property, life and supply chains. These property losses tend to be determined as much by the duration and spatial extent of flooding as by the depth and velocity of inundation. High duration floods are typically induced by persistent rainfall (up to 30 day duration) as seen recently in Thailand, Pakistan, the Ohio and the Mississippi Rivers, France, and Germany. Events related to persistent and recurrent rainfall appear to correspond to the persistence of specific global climate patterns that may be identifiable from global, historical data fields, and also from climate models that project future conditions. In this paper, we investigate the statistical properties of the spatial manifestation of the rainfall exceedances and floods.

We present the first ever results on a global analysis of the scaling characteristics of extreme rainfall and flood event duration, volumes and contiguous flooded areas as a result of large scale organization of long duration rainfall events. Results are organized by latitude and with reference to the phases of ENSO, and reveal surprising invariance across latitude. Speculation as to the potential relation to the dynamical factors is presented