Advance Forecasting of Multiple-Criteria Dates of Onset of Monsoon Rainfall with a GCM

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It has been shown that a dynamical framework exists for advance forecasting of the date of onset of summer monsoon, and that significant skill is achievable with a GCM (Goswami and Gouda, 2010). Traditionally, a single date of onset over Kerala is announced based on a set of criteria; such an announcement of onset is of restricted and limited scope. Here we show that significant skill is achievable in forecasting dates of onset based on multiple criteria based on persistence, intensity and coverage of rainfall relevant for different agro-hydrological applications. We first show that the announced DOM can be captured with sufficient accuracy using a set of objective criteria based on gridded daily rainfall data. Next we use the gridded daily rainfall to compute DOM for different criteria of coverage, intensity and persistence. Finally, these criteria are then used to predict (hindcast) and validate date of onset from a 5-member ensemble with a global circulation model for each year for the period 1980 to 2003; the forecasts capture onsets based on different criteria.[