Test of an Analogue Method for Linking the Statistics of Taiwan's Extreme Rainfall and Large-scale Patterns during Mei-Yu Season

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Abstract

In this paper we present an analogue method that will be applied for downscaling purposes of using coarse data to estimate the occurrence probability of extreme rainfall events in Taiwan. The extreme rainfall events are identified using fifty-five years (1951-2005) of hourly rainfall data with the criterion that the estimated exceedance probability of the event is less than 10% in a GEV distribution. The large-scale circulation patterns are identified using the daily data of the NCEP/NCAR Reanalysis. The preliminary results suggest that the proposed analogue method is capable of capturing the similarity in large-scale features associated with the extreme events during Mei-Yu season. The large-scale features here are identified based on the extreme event data base, which consists of data of all events from the fifth day prior to the event occurrence day to the second day after the event. The similarity is defined in terms of the phase space spanned by the leading empirical orthogonal functions of large-scale fields. The statistics of the extreme rainfall events described by the analogue method will be discussed.

Keywords: statistical downscaling, climate extremes, Mei-yu