



A role for 'major' volcanic eruptions in monsoonal precipitation variability

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Three 'major' tropical volcanic eruptions with Volcanic Explosivity Index of 5 and above occurring over the past fifty years have been investigated to evaluate their role in causing monsoonal precipitation variability. The three eruptions are the February 1963 Agung eruption in Indonesia, the March 1982 El Chichón eruption in Mexico and the June 1991 Pinatubo eruption in the Philippines. Abnormally low annual precipitation was found in the southern China region during 1963 and 1991. This is explained by the proximity of the Agung and Pinatubo volcanoes both of which are located within 3500 km of southern China causing both years to be predominated by offshore surface winds. In contrast, abnormally high precipitation was found in southern China during 1982. This is explained by the westerly spread of the eruption cloud from the El Chichón volcano which is located in excess of 8000 km across the Pacific Ocean. The cloud affecting the stratosphere was tracked by satellites and there is a match in the timing of heavy precipitation which occurred after it reached the South China Sea in about eleven days after the main eruption phase. Major tropical volcanic eruptions are therefore concluded to be a causative factor in monsoonal precipitation variability worthy of greater attention.