



## **The 2011 Thailand flood: climate causes and return periods**

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Thailand is one of the most developed and wealthiest countries in Southeast Asia. However, its tropical location and the influence of seasonal monsoon rains and local topography make it prone to floods. The Thailand floods in 2011 were especially severe causing estimated losses of US \$ 30 billion (economic) and US \$ 12 billion (insured) (Swiss Re, 2012). This insured loss ranks easily as the highest ever worldwide from a freshwater flood disaster. The primary factor behind the 2011 floods was record rainfall. Taking Thailand as a whole, annual rainfall in 2011 was the highest in the country's 61-year precipitation record. Our study first reviews the nature, impacts and historical ranking of the 2011 Thailand floods. We next examine the 2011 rainfall totals and anomalies across Thailand and use these with other data to discuss the climate causes for the exceptional 2011 rainfall. We then estimate the return periods for the 2011 rains across Thailand and compare these to satellite-derived return periods for 2011 river flow. Finally we bring together the different estimated return periods to provide an informed value for how likely it is that a flood of the magnitude of 2011 will happen again.