Conditional Probability of Consecutive Rainy Days during Monsoons in Malaysia

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Abstract. Malaysia is located in the equatorial zone and experiences a tropical climate with two seasons classified as the northeast and southwest monsoons. These seasonal changes during the two monsoon seasons last 5 months every year. The northeast monsoon brings a lot of moisture to the Peninsular Malaysia and the highest monthly precipitations are recorded from November to March. The southwest monsoon brings relatively drier air and less precipitation is recorded during the months of May to September. Daily monsoon precipitation data recorded at Subang station were gathered from the National Climatic Data Centre (NCDC). Subang station is located near Kuala Lumpur (the capital city of Malaysia) and has a long daily precipitation record, from 1960 to 2010. The longest period of continuous daily precipitation at Subang station was 32 consecutive days in October 2003. Based on this daily precipitation record, the conditional probabilities of n-consecutive rainy days are calculated for each month. It is found that the conditional probability for each month increases as the number of consecutive rainy days increases. The conditional probability in November is 0.76 for 2-consecutive rainy days and it increases to 0.79 for 6-consecutive rainy days. The analyses demonstrate that precipitation is more likely to happen if it had rained the previous day. The results also show that the hypothesis of statistical independence can only be applied during the driest months, i.e. June and July. This hypothesis is rejected during the wet months from August to May.