



## **Impact of landslides induced by 2014 northeast monsoon extreme rain in Malaysia**

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In December 2014, northeast monsoon brought extreme rainfalls to Malaysia, mainly in the eastern coast of Peninsular Malaysia and coastal area in Sabah and Sarawak. In this month, many of the rain gauge records in this area exceeded 1,000 mm, which is about 1/3 of average annual rainfall precipitation (2,850mm/year) in Malaysia. This unexpected heavy rainfall induced landslides and floods which brought about large-scale losses in Malaysia equivalent to several hundred million USD as thousands of residents had evacuated from hometown for months, and factories, schools and business activities were shut down for weeks. Among the major infrastructure of the nation, East-west Highway was subjected to damages by 21 landslides. Two large-scale landslides cut off the highway for a week.

Authors had installed landslide monitoring instruments at reactivated landslide sites along the highway at N05° 36.042' E101° 35.546'. Records by in-situ inclinometers showed clear deformation from 17th December to 26th December, associated with certain change in piezometeres record for groundwater level monitoring. Several cracks occurred in the slope.