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From the Landslide to the Mangrove; Coupling Sediment Supply Pulses and River Sediment Deposits in the context of Climate Change in Thailand.

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In Thailand landslides and flooding are two major natural disasters affecting more than 11 million people living in coastal provinces. Such events have significant human and economic impacts. For example, in 1988, landslides resulted in 373 deaths and caused up to US\$80 million in damage (Tanavud, 2008); in 2011, floods and landslides affected more than two million people and killed 53 across Southern Thailand with a village of about 100 households being buried by one large slide (EarthObservatory, 2021). Landslides in the Krabi province in Thailand are predominantly shallow and rainfall-induced, they also represent the main source of sediment pulses for coastal environments such as mangroves and beaches. This study aims at investigating the link between sediment availability from 3 river catchments in the province of Krabi in Southern Thailand and sedimentation rate evolution in mangroves directly downstream in order to understand coastal the sediment shortages and therefore coastal erosion in that area.

Landslide inventories were evaluated using high resolution imagery (<10m) such as aerial photographs, Theos and EO-1 satellite imagery, Google Earth historical tool covering a time period from 2007 to present. Calculations of the surface areas and volumes of landslides was calculated in ArcMap using the formulae developed by Larsen et al. (2010). Landslide erosion was modelled using an approach based upon the negative power law scaling properties of rockfall magnitude–frequency distribution to establish total volumes of sediment for specific years or seasons.

Core samples taken in the mangroves near the river mouths were used to identify markers of landslide events and associated sediment cascades based on grain size distribution and ¹³⁷Cs dating.

Preliminary results show sedimentation rates in the mangroves from 0.9 to 2 mm/year since 1963 and sediment volumes made available to transport from 0.3 to 68300 m³/year since 2007 across the 3 catchments.

Grain size analysis shows variations of the D_{50} and the sorting coefficient throughout the sediment recording indicators of landslides and high intensity rainfall events.