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# Modern and historical deposits of tropical cyclones and tsunamis at the coast of Myanmar – Implications for preservation potential and identification in the geological record

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Myanmar's coast is prone to flooding by both tropical cyclones (TCs) and tsunamis from multiple sources. However, although TCs (e.g. TC Mala 2006 and TC Nargis 2008) and tsunamis (2004 Indian Ocean Tsunami) repeatedly caused flooding during the last decades, the temporal restriction of existing records limits the robustness of regional long-term frequency-magnitude information. While there is only a single historical tsunami in AD 1762, associated with a major rupture of the Rakhine segment and with inconclusive information with regard to its impact at the coast, that provides data beyond the instrumental record, sediments of past flooding events might allow the extend it to much longer time periods.

So far, very limited research on coastal flooding deposits has been conducted in Myanmar. This study presents first results of a field survey along Myanmar's western (Rakhine) and eastern (Thanintharyi) coast that aimed at (i) investigating sediments of modern tsunamis and TCs as local references for regional characteristics and preservation potential of both types of event deposits; and (ii) using this information on deposits of prehistoric TCs documented in the swale of a beach-ridge plain at the Rakhine coast that, eventually, may contribute to an improved long-term hazard reconstruction of the region.

Onshore deposits of 2006 TC Mala and 2008 TC Nargis were documented both at the west and the east coast, where they form sand sheets with landward extents of up to ~100 m or washover fans in back-beach areas. Significant flooding by the 2004 tsunami was only reported at the eastern coast, where it might be reflected by a thin sand sheet identified in a paddy field. However, at most sites these flooding deposits display a very poor preservation potential. After only a few years most evidence is already overprinted by soil formation that probably obliterates all differences to sandy subsoils within decades. Only where sand sheets extend into back-barrier depressions characterized by the deposition of terrestrial fine sediments during the rainy season, preservation may potentially allow for detection after longer time periods. The most promising archive is a beach-ridge plain at the west coast, where distinct marine sand layers with ages of ~30 and ~80 years were observed in the clayey in-situ sedimentation of swales located beyond the reach of modern TC deposition. Luminescence data of beach ridges indicate that the more landward swales of the beach-ridge plain, which have not been investigated yet, may record much older events within the last few millennia.