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New approaches in geological studies of tsunami deposits

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During the last dozen of years tsunamis have appeared to be the most disastrous natural process worldwide. The dramatic, large tsunamis on Boxing Day, 2004 in the Indian Ocean and on March 11, 2011 offshore Japan caused catastrophes listed as the worst in terms of the number of victims and the economic losses, respectively. In the aftermath, they have become a topic of high public and scientific interest. The record of past tsunamis, mainly in form of tsunami deposits, is often the only way to identify tsunami risk at a particular coast due to relatively low frequency of their occurrence. The identification of paleotsunami deposits is often difficult mainly because the tsunami deposits are represented by various sediment types, may be similar to storm deposits or altered by post-depositional processes. There is no simple universal diagnostic set of criteria that can be applied to interpret tsunami deposits with certainty. Thus, there is a need to develop new methods, which would enhance 'classical', mainly sedimentological and stratigraphic approach. The objective of the present contribution is to show recent progress and application of new approaches including geochemistry (Chagué-Goff et al. 2017) and paleogenetics (Szczuciński et al. 2016) in studies of geological impacts of recent tsunamis from various geographical regions, namely in monsoonal-tropical, temperate and polar zones. It is mainly based on own studies of coastal zones affected by 2004 Indian Ocean Tsunami in Thailand, 2011 Tohoku-oki tsunami and older paleotsunamis in Japan, catastrophic saltwater inundations at the coasts of Baltic Sea and 2000 landslide-generated tsunami in Vaigat Strait (west Greenland).
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