

Identification process and criteria of tsunami deposit

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Identification of tsunami deposit has frequently been discussed in many papers (e.g., Morton et al., 2007; Goff et al., 2012). This is because sedimentary features of tsunami deposit are usually similar to those of other deposits formed by storm and flood events. In this study, we compiled identification criteria and process of tsunami deposits based on the review of previous publications specifically from Japan. According to the previous papers, at first, the tsunami geologists usually identify an event deposit, which is defined as a deposit that was instantaneously formed during geological event (group X). Then, they further investigate whether any evidence of tsunami origin can be observed in the deposits. Based on the evidence, the deposits can be further classified into 5 groups (groups C, B, A1, A2, and S). Once the event deposit is recognized, presence of characteristic sedimentary features such as basement erosion and upward grading is evaluated (group C). Although these sedimentary features are not necessarily definitive evidence of tsunami deposit, they are typically observed in the recent tsunami deposit. The deposit is further evaluated if there are any materials that are characterized by landward sediment transport from the sea (group B). The deposit may show evidence of distinctive tsunami origin in some cases (group A1). For example, the deposit sometimes contains marine microfossils that were derived from the sea floor below the storm wave base (e.g., Uchida et al., 2010). Numerical modeling would also be strong tool to exclude the possibility that the deposit is formed by storm impact, although such analysis has rarely been conducted. Historical record is another useful tool to correlate depositional age of the deposit and historical tsunami (group A2). Such simultaneity in age are typically used to identify historical tsunami deposits especially in Japan since there are long historical records. Identically, the deposit can be identified as tsunami deposit if both geological and historical evidences are sufficiently collected (group S). Although identification criteria may be expanded in the future due to the progress of the research, the current compilation would be useful to consider the validity of tsunami origin of the deposits.

Keywords: tsunami deposit, identification criteria