



Turbidite evidence on repeated generation of the 2011 Tohoku-oki-like earthquakes along the Japan Trench

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To understand mode of tectonic movements along the subduction margins, it is important to know the recurrence pattern of the large earthquakes and its variability. Deep-sea turbidite is a potential tool for reconstructing the past large earthquakes along the margins. The Japan Trench is composed of a series of small basins reflecting the subducting horst-graben structure. Each small basin acts as a natural sediment trap receiving the earthquake-induced turbidity currents. Therefore, the Japan Trench floor is a preferable location for the turbidite paleoseismology. However, the sediment core data has been limited due to the >7 km water depth. We collected 19 sediment cores from the Japan Trench floor. Most of sediment cores contain several thick muddy turbidites. In some cores, however, single and thin coarse-grained layers without turbidite mud are intercalated in bioturbated diatomaceous clay. Thus, turbidite stratigraphy of the Japan Trench sediments has large variability. On the other hand, the same turbidite stratigraphy in shallow part of the cores was observed near the large slip area of the 2011 Tohoku-oki earthquake. This may indicate the repeated occurrence of the 2011-like earthquakes along the Japan Trench. Even in the large water depth environment, tephra provides the important time horizon. We found three important Holocene tephras from the cores. These tephras might connect the deep-sea event deposits and onshore tsunami deposits. Such connection might provide new insights into past tsunamigenic earthquakes along the Japan Trench.