

## Shallow-marine sedimentary processes of the 2011 Tohoku earthquake tsunami, inferred from sediment c

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While subaerial tsunami deposits have been much explored in recent years, our knowledge of shallow-marine tsunami sedimentation and its resultant deposits is limited. In August and September 2012, we practiced vibrocore drilling at 44 sites in Sendai Bay off the Pacific coast of northeastern Japan to investigate features of the open-sea shallow-marine deposits of the 2011 Tohoku earthquake tsunami and their variations. The tsunami deposit was inferred in the uppermost part of the cores based on the extent of bioturbation and concentrations of short-lived radionuclides. The preserved tsunami deposit, where identifiable, is typically 10-50 cm thick. Its grain size is basically similar to that of the original sediment at each site, which differs from medium to fine sand in the lower shoreface, through very fine sand to clay in the inner shelf, to poorly-sorted gravel, sand and mud offshore. This suggests the limited extent of cross-shelf sediment transport. Several lower shoreface sites show a yellowish coarse sand layer at the top. This yellowish layer is differentiated from the underlying greenish gray sand, and is possibly composed of beach sand transported by the tsunami backwash. In the inner shelf, the tsunami layer tends to show multiple inverse and normal grading of grain size as known in some of subaerial tsunami deposits. These features may help identify older shallow-marine tsunami deposits although more research in different settings is needed for establishing comprehensive criteria.