

Effects of mass sedimentation event after the 2011 Tohoku earthquake on benthic organisms in the upper bathyal sediments

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We examined the effects of mass sedimentation events caused by the 2011 off the Pacific coast of Tohoku earthquake on abundances and vertical distributions of prokaryotes and metazoan meiofauna in sediments, using sediment cores collected from eight bathyal stations off Tohoku 1 and 2.5 years after the M9.0 earthquake. Event deposits of 1 to 7 cm thick were observed at the topmost part of the sediment cores at all sampling stations. At some stations, prokaryotic cell abundances were lower in the surface event-deposit layers compared to those in deeper sediments. These variations were explained by environmental parameters such as a sorting factor and mean grain size, suggesting that turbidite sedimentation affected prokaryotic cell abundances. Nematodes had anomalously higher subsurface abundances at the stations where subsurface peak prokaryotic cell numbers were observed. Although there are no corresponding data before the earthquake from the same sites, it is likely that the subsurface peaks in prokaryotic cell numbers and meiofaunal density resulted from the sedimentation events. The effects of sedimentation events on the organisms were observed 2.5 years after the earthquake, indicating that episodic sedimentation events on scales of several centimeters have a large effect on small organisms inhabiting sediments.

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