

## Bioturbation in shallow marine deposits along Sanriku Coast after the 2011 tsunami disturbance

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The huge tsunami waves induced by the 2011 M9.0 Tohoku-Oki Earthquake severely affected shallow marine ecosystems along the Pacific coast of northeastern Japan (Seike et al., 2013). This study focuses on sedimentary features (physical and biogenic sedimentary structures) of shallow marine deposits along Sanriku Coast, i.e., Funakoshi and Onagawa bays, northeastern Japan after the 2011 tsunami disturbance. Core samples were observed using X-ray radiography, computed tomography scanning, and grain size analysis to identify temporal changes in the physical and biogenic sedimentary structures following the 2011 tsunami disturbance. At Funakoshi Bay, Iwate Prefecture, sediment coring was conducted in September of 2014. The seafloor sediments of this bay were composed of laminated sandy deposits (tsunami-induced deposits). The upper section (between the surface and a depth of 20 cm) was totally mixed (bioturbated) by burrowing activity of the heart urchin *Echinocardium cordatum*, and contained no physical sedimentary structures. At Onagawa Bay, Miyagi Prefecture, sediment coring was conducted between October 2012 and April 2013 (three observations). The seafloor sediments of this bay consisted of two lithological layers. The upper section was composed of muddy sediments whereas the lower part of the cores (below a depth of 8 cm) consisted of laminated sandy deposits (tsunami-induced deposits). In 2012 and 2013 observations of the bay, burrows produced by benthic animals were seen only in the upper mud layer. In contrast, in 2014 observation, abundant burrows were seen in both the upper mud and lower sand layers. These results from Funakoshi and Onagawa bays indicate that recolonization of large and deep-burrowing animals began within three years of the 2011 tsunami. Also, the intense sediment mixing by large burrowing animals will homogenize the seafloor sediment.

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