

Ecological impact of the T?hoku Tsunami on shallow-water marine biodiversity off Hachinohe (NE JAPAN)

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The 11th of March 2011, Japan was struck by one of the most powerful known earthquakes, the so-called T?hoku earthquake. This earthquake presented a magnitude of 9.0 and an epicenter located 70 kilometers east of the Oshika Peninsula of T?hoku. It triggered extremely destructive tsunami waves of up to 10 meters that struck Japanese coasts. Both earthquake and tsunami caused extensive and severe structural damage in Japan. More than 15.000 people died; 8.000 are still missing. This aim of the present study is to evaluate the post-crisis environmental health of the marine biosphere from the NE Japan. In order to assess the impact of this terrible disaster on marine ecosystems, and more precisely, to assess the impact of tsunami on coastal marine ecosystems, an oceanographic cruise occurred in August 2011 and sediments off Iwate prefectures (NE JAPAN) were sampled. Living benthic foraminifera collected in these sediments were used as bio-indicators of sedimentary disturbance. Indeed, after a sediment gravity event (e.g. turbidite) triggered for instance by an earthquake, high amount of organic and inorganic detritus may be supply by lateral advection to the ocean. There, foraminiferal faunas are characterised either by recolonisation stages occurring after physical disturbance (e.g. turbidite related to tsunami) or by equilibrium phases related to gradual organic matter focussing (e.g. eutrophication). Biotic recovery after benthic crisis consists in the dominance of opportunistic pioneer species. The foraminiferal biodiversity is low. When the resilience of an ecosystem is surpassed (after weeks, months or years), opportunistic taxa are generally replaced by highly specialised communities. Then, the foraminiferal diversity increases. In case of the T?hoku Tsunami, the inherent question is: Do benthic Foraminifera indicate environmental alteration/resilience of marine biodiversity in relation to tsunami?

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