

Unexpected type of biodiversity disturbances of benthic ecosystem of off Shimokita after 3.11

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On March 11th, 2011 the Mw 9.0 2011 Tōhoku-Oki earthquake resulted in a tsunami which caused major devastation in coastal areas. Along the Japanese NE coast, tsunami waves reached maximum run-ups of 40 m, and travelled several kilometers inland. Whereas the devastation was clearly visible on continental areas, the underwater impact was much more difficult to assess. Here, we report unexpected results during a research cruise targeting the marine floor off Shimokita (NE Japan), five months after the disaster. The geography of the studied area is characterized by smooth coastline and a gradually descending shelf slope. Although high-energy tsunami waves caused major sediment reworking in shallow-water environments, shelf ecosystems were characterized by surprisingly high benthic diversity and showed no evidence of mass mortality. Conversely, just beyond the shelf break, the benthic ecosystem was dominated by a low-diversity, opportunistic fauna indicating an ongoing colonization of massive sand-bed deposits.

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