

## Comparison of seabeds at <2000 m in water depth off Miyagi before and after the 2011 Tohoku-Oki earthquake

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The 2011 Tohoku-Oki earthquake of Mw 9.0 occurred on 11 March 2011. This earthquake excited large tsunamis, which were generated turbidity current as a tsunamigenic turbidity current (Arai et al., 2013). We do not know well how such turbidity currents will record in sediments in the future.

We investigated the impact of the tsunamigenic turbidity currents by seabed observations. Additionally, we discussed how the tsunami event will be preserved in deep-sea sediments.

We observed the video data of six dive surveys. The two dive surveys of 3K#483 and 2K#1220 have done on 5 September 2000 and on 19 September 2000 during the cruise NT00-09 by R/V NATSUSHIMA. A deep-sea camera survey of YKDT#100 has done on 21 June 2011 during the cruise YK11E-04 Leg 2 using R/V YOKOSUKA. The site P08 was dived on 25 September 2011 during the cruise by HAKUYO3000. OFOS-1 and -2 were dived on 18 March 2012 during the cruise SO219A by R/V SONNE. In addition, seabed sectional view were made by PARASOUND in the cruise SO219A.

We observed the change of seabed before and after the Tohoku-Oki earthquake. We could see various alive benthic animals (e.g. sea anemones, sea pens and star fishes) on the muddy mounded seabed. There are no strong flow signals being a strong bottom current from the video observations. We found many dead bodies of benthic animals which were covered with bacterial mats by YKDT#100 and P08 videos. The size of bacterial mats was about 1 m in diameter. After one year from the earthquake, the size of bacterial mats had become small about 10 cm in the OFOS video data. Therefore, the bacterial mats were made after earthquake by seabed disturbance, but bacterial mats would not record in sediment.

On the other hand, we found lines of evidence on the turbidity current which have the potential of preservation in sediments. We observed the bio-fragments scattered on seabed by YKDT#100 and OFOS videos. We measured these direction and we found majority of these faced the SW-NE. Thus, these indicate the direction of the strong flow (e.g. turbidity current) in recent. Our results support the direction of the turbidity current indicated by Arai et al.,(2013). The benthic animals as bio-fragments would record in sediments and would become evidence of tsunami/earthquake events.

Keywords: R/V SONNE, Tsunami deposit, biofragment, paleocurrent