

## Long term monitoring of bottom environments off Ohtsuchi Bay

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The 2011 off the Pacific coast of Tohoku Earthquake induced heavy disturbances on sea floor environments in wide areas from coastal zone to the hadal trenches in the northerastern Japan (Kawagucci et al., 2012; Noguchi et al., 2012; Arai et al., 2013; Oguri et al., 2013). On the sea floor, strong turbid layers were developed presumably by strong shaking or intensified hydrodynamic surges by tsunami (Toyofuku et al., 2014). To investigate environmental changes or the recovery from the disturbances, we conducted long term monitoring at 300m and 998m in water depth off Ohtsuchi bay.

For the monitoring, two monitoring stations were constructed to mount ADCP-CTD-DO-turbidity sensors (Aanderaa RD600), combinations of LED light, HDTV camera and lithium-ion battery (handmade) on a titanium frame. The hydrodynamic and chemical data were acquired every one hour interval. The still images were taken every day and the 4.5 minutes videos were recorded every week, respectively. The station was deployed at 300 m depth from 2013/3/12. Although this station was unexpectedly captured by a trawling boat, the data and the photographs recorded for five and half months were recovered. At 998 m depth, the other station was deployed from 2012/8/12, and it was safely recovered during R/V Natsushima NT13-21 cruise.

At 300 m depth, dominated current direction was NNE to SSW. The 25 hours averaged current intensity was 0-30 cm/sec. Decrease of water temperature from 8 to 2 oC was observed on May/2013. Salinity decrease from 33.3 to 32.8 was also synchronized with the temperature variation. These changes seemed to reflect contribution of Oyashio water. Dissolved oxygen (DO) ranged from 290~250  $\mu$ M, but it was suddenly decreased to ~100  $\mu$ M, and recovered in a few hours to a few days. Turbidity showed increased trend in a short time on April to May/2013, reflecting phytoplankton blooming observed by remote sensing. This period, strong turbidity by marine-snow was also recorded by the camera. Photographs taken at the sea floor recorded high density habitats of brittle star. A few fishes and other organisms (sea anemone etc.), were also observed.

At 998 m depth, dominated current direction was also NNE-SSW. The averaged intensity was 0~15 cm/sec. Water temperature was 3 oC and the salinity was 34, which ranged almost constant values throughout the deployment. DO was 25~29  $\mu$ M, indicating just in the DO minimum zone. Turbidity was increased after Feb/2013, but it seemed to reflect biofouling, because bottom water was not turbid from the photographs.

On 2012/12/7, strong earthquake (M=7.3) supposed as an aftershock of the Tohoku earthquake occurred. The camera recorded the turbulences of sea floor and benthic habitats. Turbidity was intensified just after the earthquake and brittle stars were buried. However, the turbidity and the activity of the benthic habitats were recovered quickly and the effect of the earthquake seemed to be small for the organisms.

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