Crustal deformation due to the Noto Hanto earthquake in 2007 estimated from the pre-earthquake sea level

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In order to reveal the crustal deformation on the west coast of Noto Peninsula due to the Mj 6.9 Noto Hanto earthquake of March 25, 2007, we investigated the height distributions of marine livings, such as oysters, mussels, seaweeds and tube worms as indicators of pre-earthquake sea level.

The first campaign was carried out from March 26 to 31, and measured the altitude of oyster colonies at 15 ports along the 50-km-long coast from Wajina City to the middle of Shiga Town. The distribution of oyster colonies shows a maximum up-lifting of ca.0.4m at the Tsurugiji Port situated in the center of the aftershock area, as compared with the Wajima Port where the co-seismic vertical displacement was almost fixed according to the GPS observation by the GSI. The vertical displacement gradually decreases to the north and shows a sudden drop between the Kaiso and Hukami Ports near the northern rim of the aftershock area. The Fukami Port was subsided 0.1m. To the south, the height also gradually decreases. We measured a 0.1 m of subsidence in the far south of aftershock area during this campaign. The second campaign between April 3 and 5 measured the height of tube warm colonies at 20 locations. The height distribution indicates the same pattern and a maximum uplift of 0.6 m near the Tsurugiji Port. We measured a 0.1-0.2 m of uplift on the far south coast. On the south coast of surveyed area, there may be temporal tide level changes between the first and second campaigns and local changes compared with the Wajima tide station.

We estimate a 1.2 m of slip and a 2 km of fault top depth from these crustal deformation for a source fault with L=15km, W=12km, strike=58 deg., dip=60 deg. and rake=117 deg. (Mw=6.5).