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Urgent survey of the tsunami of "The 2011 off the Pacific coast of Tohoku Earthquake" on the Pacific coast of Hokkaido

Satoshi Ozawa^{1*}, Noritoshi Okazaki¹, Kenji Nishina¹, Gentaro Kawakami¹, Sunao Ohtsu¹, Takahiro Suzuki¹, Makoto Tamura¹, Yusuke Morino¹, Tomo Shibata¹, Wataru Hirose¹, Ryo Takahashi¹, Satoshi Ishimaru¹, Yasuyuki Kakiyama¹, Tagiru Ogino¹, Masahiro Yahata¹, Jun Tajika¹

¹Geological Survey of Hokkaido

The strong ground motion, caused by "The 2011 off the Pacific coast of Tohoku Earthquake" on 11 March 2011, according to Japan Meteorological Agency (JMA), registered 7 on the seismic intensity scale in Kurihara city of Miyagi Prefecture. And that recorded an upper 6 on the seismic intensity scale in a large area of Miyagi, Tochigi, Ibaraki and Fukushima prefecture. In Hokkaido prefecture, the ground motion recorded 4 on the seismic intensity scale in maximum, in a wide area on the coast of Pacific Ocean. The tsunami of this earthquake caused extensive and severe damage in a wide area on the coast of Pacific Ocean in Tohoku region and Kanto region near the epicenter, also in parts of the coast of Hokkaido. In Hokkaido, according Hokkaido local government (summary 11 April 2011), this tsunami caused damages such as casualties (1 death, 3 minor injured), house damage (294 flooded above floor level, 435 flooded under floor level), fishery damage (148 fishing ports & fisheries, 318 fisheries facilities, 768 fishing boats . 16 fish farms).

Geological Survey of Hokkaido organized a tsunami research group immediately after the earthquake. Then, in cooperation with Institute of Seismology and Volcanology of Hokkaido University and Sapporo District Meteorological Observatory, the tsunami research group urgently had survey for the purpose of measurement of the height (elevation) of the tsunami traces which were left in coastal ports and rivers and beaches, and also the purpose of observation of tsunami sediments. As the first survey, 3 teams (3/14 - 3/16, 7 people in total) surveyed 3 regional areas of south Hokkaido area, central Hokkaido area and east Hokkaido area. Then, the second survey (1 team: 3/17 - 3/18, 2 people) and the third survey (2 teams: 3/24 - 3/24, 2 people; 3/23 - 3/26, 2 people) were conducted for the purpose of supplemental and targeted survey.

We mainly used GPS survey equipment to measure the ground elevation of the survey site. And hand level equipment was also used to measure the height of the tsunami traces from the ground elevation. In addition some sites, we measured the height of the tsunami traces from the elevation basis such as tidal elevation, using hand level equipment. In addition, we calculated the tsunami height from tidal level using tidal observation data of JMA.

Tsunami height survey results, although there is variation with the influence of coastal topography, as general tendency, the tsunami height is estimated to become highest in the region between Cape Erimo and Shiranuka town. In there, tsunami height is estimated to 3 to 5 meter high (maximum 5.7 meter at Kinashibetsu in Onbetsu-cho Kushiro city). In the west (Hakodate city - coast along Uchiura bay - Tomakomai city - Urakawa town), the tsunami height is estimated to 1 to 3 meter high. In the east (Kushiro city - Nemuro city), the tsunami height is estimated to 1 to 4 meter high, and become lower towards east.

In addition, we offers the results of Tsunami survey from Web-GIS site. Please visit "<http://webgis.gsh.hro.or.jp/tsunami/>".

Keywords: tsunami height, tsunami sediments, The 2011 off the Pacific coast of Tohoku Earthquake, Hokkaido