Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

HDS28-P01 Room:Poster Time:May 1 18:15-19:30

Influence of mircotopography in lowland to tsunami disaster of 2011 Tohoku Earthquake

IKARI, Kazuya[1*] ; NARAMA, Chiyuki[2]

[1]Graduate School of Science & Technology, Niigata University, [2]Faculty of Science, Niigata University

The earthquake (magnitude 9.0) on Mar 11, 2011 in Tohoku, Japan triggered the terrible destructive tsunami, striking the eastern coastal region of Japan. Although residents in valley bottom plain of the Sanriku Coast (ria coast) have a refuge area around hills, residents in Sendai Plain (meander plain of lowland) had to go to inland in order to escape tsunami. The lowland such as Sendai Plain is very vulnerable to tsunami. However, Building damages differed among the Sendai Plain. This study evaluated the influence of landform in lowland of Sendai Plain to tsunami disaster.

The Sendai plain is meander plain of lowland (0-3m asl.), including beach ridges and inter-ridge march of ridged beach plain, and natural levees along present and mender scars.Three beach ridges are developed along the coast. Relative height of present beach ridge is 3-5m, and inner two beach ridges are 1-2m.

We classified three damage-categories (flow out, destroy, and remain) to individual buildings in tsunami inundation area of the Sendai Plain, based on interpretation of aerial-photographs on 2011 and Google Earth satellite image 2012.In addition, we made a GIS data of utility pole, flattened tide protection forest, driftwood, tsunami scratch in Sendai Plain, to know flow directions of tsunami and distribution of woods.

Building damages in the Sendai plain show >80% of buildings flowed out within 1km area from the coast. Remaining buildings are located on ridged beaches with 1-2m high. Driftwood and rubble had stopped on the near side of beach ridges and highway embankment. Tsunami flow was concentrated in the inter-ridge march or small stream channels. Around the Abukuma River, buildings under cut slope received tsunami damage, and slip-off slope side was safety. In lowland plain, we clarified microtopography with 1-2m relative height reduced tsunami damages around inland side area (>1km) from the coast.

Keywords: 2011 Tohoku Earthquake, tsunami, Sendai Pliain, lowland, mircotopography, aerial-photographs