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Distribution of housing damage around Tsukuba and Tsuchiura cities using Google Earth images

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On March 11, 2011, the intensities 6 lower were recorded around Tsukuba and Tsuchiura cities due to the 2011 off the Pacific coast of Tohoku earthquake. To reveal the relationship between the damage and the geological conditions, we carried out the mapping of roofing tile damage (based on the presence of tarpaulin on the roof) using the Google Earth images, then we clarified the distribution of housing damage around Tsukuba and Tsuchiura cities.

The damage distribution map shows that the damage around the Tsuchiura, Arakawa-oki, and Ushiku stations was severe. The Hojo area, the area from Imakashima to Hakke, and the Yatabe area in Tsukuba City were also severely damaged. These areas are not situated only on Sakuragawa Lowland (alluvial plane) but also on the Sakuragawa Terrace (lower terrace) and the Joso Terrace (middle terrace). Therefore, we interpret that the earthquake damage in the study area were not depend solely on the surface geology and topography. Hence, we need a consideration of subsurface geology (ex. Middle Pleistocene buried valley and pre-Neogene basement morphology)

Keywords: 2011 Off the Pacific Coast of Tohoku Earthquake, Google Earth image, damage of roofing tiles, Tsukuba City, Tsuchiura City