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## Flash report of the housing and ground damage around Tsukuba and Tsuchiura cities due to the 2011 Off the Pacific Coast

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The 2011 off the Pacific coast of Tohoku Earthquake (Mw 9.0) caused severe damage to housing and ground in the urban area of Tsuchiura. In order to clarify the relationship between the damage and the geological conditions, we have made an investigation on (1) damage of roofing tiles, (2) damage of outer walls, (3) collapse of fences and garden lanterns, (4) sand boils and (5) land subsidence and cracks, 6) others (e.g. landslides) in the Tsuchiura-Tsukuba area of which detailed geologic map (Unosawa et al., 1988) was published.

Our investigation reveals that damage on the Sakuragawa Lowland (alluvial plain) was the most severe in the study area. The Sakuragawa Terrace (lower terrace) which is underlain by sand and pebble was less damaged, but the widespread Joso Terrace (middle terrace) composed of sand and mud was severely damaged as well as the Sakuragawa Lowland. Consequently, the most of the terrace areas, generally known as earthquake-resistant topography, were likely to tremble furiously during the earthquake, as well as the alluvial plains.

In the reclaimed areas around the Tsuchiura Port, we recognize some sand boils, but housing damage was not salient.

Keywords: 2011 Off the Pacific Coast of Tohoku Earthquake, Tsukuba City, Tsuchiura City, damage of roofing tiles, sand boils