

The liquefaction of reclamation ground analyzed by using airborne laser scanner and old edition map

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The sediment runoff originated in liquefaction was caused by the Tokachi-oki Earthquake in 2003 (Mj8.0) in the Tanno Town, Hokkaido, Japan. The earthquake registered an intensity of 4 in Tanno Town of 230km from epicenter. The region is the gradual plateau to the distribution of pyroclastic flow deposits that erupted from the Kussharo caldera. Liquefaction was occurred in the reclamation ground of the valley fill.

A big feature to liquefaction is the following two points. 1) The jetted sand is hardly seen in surface of the ground. 2) The sediment runoff is chiefly limited to the side and the end of the subsidence part. We used and interpreted the aerial photograph and the relief map by airborne laser scanner digital elevation model (ALSDEM). The main scarp seems to develop along the valley. When we researched the old edition topographical map, we traced that this area was used as the rice field and the pond.

If the old topographical edition map is researched, it seems to understand the place of the valley fill. Then, we made the land application transition map with GIS. After having scanned the old edition topographical map at five times, we digitized the land application. We divided the land application into six (the rice field, the field, the house, the forest, the wasteland, and the reservoirs). The result of the land application transition is as follows. There were a lot of rice fields and the forest, and some reservoirs existed in around 1977. On the other hand, the rice field and the forest were diverted to the field, and the reservoir disappeared in around 1987. However, all places where the rice field had been diverted to the field were not valley filled. The land application transition map shows that only a land use transition is expressible, and the examination including the change in the elevation data is necessary. Therefore, it is necessary to consider the change in not only the land application transition map but also topographical features.