Liquefaction damage in the Niigata City area due to the 2024 Noto Peninsula Earthquake

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The Noto Peninsula Earthquake that occurred on January 1, 2024 caused extensive liquefaction damage mainly in Nishi Ward, Niigata City. As of February 20, the number of damaged houses in Nishi Ward was approximately 9,245. Niigata University conducted a comprehensive survey of various phenomena associated with liquefaction (e.g., sand eruptions, house damages, cracks (landslides), etc.) from January 4, 2024. The survey revealed that liquefaction damage was concentrated at (1) the end of the sand dune slope (along Prefectural Road 16 from Aoyama to Uchino), (2) the Shinano River flow path (Yamada to Zenku and Amano in Kounan Ward), and (3) reclaimed land in lowland areas. The distribution of damage is almost consistent with the distribution of liquefaction damage caused by the 1964 Niigata earthquake, except for the areas that were urbanized after 1964. Furthermore, the topography, geology, and land history characteristics of the areas from (1) to (3) suggest that the factors causing liquefaction damage are different. In addition, Niigata University has conducted a study to obtain basic information on liquefied ground, which is the foundation for rebuilding houses, by combining SWS tests and borehole investigations, because specific data such as the depth of liquefied strata and vertical distribution of ground strength for each district are insufficient at a time when disaster victims are strongly thinking about rebuilding their houses. The SWS test and borehole investigations were used to investigate the liquefaction depth, facies, and continuity of the ground structure. The following is a summary of these investigations.

Keywords: 2024 Noto Peninsula Earthquake, Liquefaction, Niigata City

