

Mapping of liquefied sites in central Ishikawa, Toyama, and Niigata prefectures caused by the 2024 Noto Peninsula earthquake

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Mapping of Liquefied sites (sand boil) during the 2024 Noto Peninsula earthquake were carried out in central Ishikawa, Toyama, and Niigata prefectures by means of detailed field surveys. The topographical conditions and land history of the liquefied sites were investigated by overlay analysis of GIS using GSI topographic classification maps, old topographic maps and aerial photographs taken in the past.

Sand dunes have developed along the Sea of Japan coast from Kanazawa City to Hakui City, and liquefaction occurred in areas corresponding to the inland foot of the dunes. In these liquefied sites, many structures damages such as subsidence and tilting of residential houses, roads, and electric poles that was thought to be caused by lateral flow associated with liquefaction. In Himi City, Toyama Prefecture, liquefaction occurred on the beach ridge along the coastal area, causing damage such as uneven settlement of many residential houses.

Liquefaction-induced damages has occurred significantly in former river channels of Shinano River in Niigata City. River improvement of Shinano River in this area has undertaken during the Edo and Meiji periods, and former river channel has reclaimed, and then residential land development progressed after 1960s. The Fushiki district of Takaoka City has also sustained severe liquefaction-induced damages. This area has reclaimed former wetland in the late Edo period and turned into an urban area (residential area). In the central city of Himi City, liquefaction has occurred over a wide area, and it is possible that this area is an area where former river channels and wetlands were reclaimed (embanked) after the Edo period. The occurrence of liquefaction was confirmed in the former river channels of the Jinzu River in Toyama City, the Shogawa River in Takaoka City, and the Hakui River in Hakui City.

In Nanao City, Himi City, Takaoka City's Fushiki District and Imizu City, liquefaction was observed at many locations in coastal reclaimed land. Many of these reclaimed lands were reclaimed and developed after the 1980s.

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