

A study on the long-term stability in and around the Horonobe area

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This article presents the preliminary results of literature surveys and of field investigations in terms of the long-term stability in and around the Horonobe area. The Horonobe area is situated in the Tenpoku Sedimentary Basin, and is dominated by the Neogene to Quaternary sedimentary sequences. Based on the time-stratigraphy and sedimentary analyses, eastern part of the area has become to land prior to the west after the middle to late Pliocene. As a result of analysis for the distribution of hypocenters for micro-earthquake, of geologic structures, and of the Quaternary sediments, present-day activity has been localized with the western part of the Horonobe area. In addition, based on the examination of the seismic reflection profiles in the western part of the area, it is suggested that the geological structure in this area is the fold-and-thrust belt with westward vergence, and the formation of the structure has begun in three million years ago.

The Horonobe area has widespread distribution of the marine terrace deposits, which are correlated to the marine oxygen isotope stages (MISs) 9 through 5c. The elevation of these marine-terrace surfaces on hinge zone of anticline is higher than that on limb in the Sarobetsu Anticline at the western part of the area. The former shoreline of MIS 1 proceeded ca. 10 km away from that of MIS 7 in this area although there is no significant difference in global-scale sea-level at each stage. The active folds are distributed in the area to be changed into the land in MIS 1. In order to assess the long-term stability of the geological environments in the Horonobe area, it is important to consider the faulting and folding effects to the uplifting, subsidence, migration of shoreline and so on.