

Migration of active deformation zones since late Pliocene in the Horonobe area, northern Hokkaido

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We carried out literature surveys and field investigations about the long-term stability of the geological environments in the Horonobe area, northern Hokkaido. In the area, it is important to consider the migration of active deformation zones with the faulting and the folding since late Pliocene time in order to assess the long-term stability of geological environments.

The area has two main faults called the Horonobe Fault and the Omagari Fault from the east. These faults divide the Soya hill into three parts, the western, central, and eastern parts. The area is dominated by Neogene and Quaternary sedimentary sequences. Main investigation targets in this study are Pliocene and Pleistocene sedimentary sequences. We clarified the stratigraphy of the sequences on the basis of Fission Track ages of widespread volcanic ashes and bio-chronology. Comparing the age for same facies deposited after the early Pliocene, one of the western part shows younger age than the east. This fact shows that depositional areas have migrated from the east to the west since late Pliocene time in the area. In addition, based on the hinterland analysis using reworked fossil diatoms, we can conjecture that uplift areas of the hill have migrated toward the west since late Pliocene time. Moreover, the area has following facts: (1) the area is divided into three parts in two main faults, (2) the area is dominated by the fold structure, (3) fault and fold axial planes are the same trend as the long axis of depositional and hill areas.

Based on these facts, it is clear that the faulting and the folding caused the uplift and the subsidence. Because uplift and subsidence areas have migrated toward the west since late Pliocene time, it seems reasonable to suppose that the active deformation zones with the faulting and the folding has migrated toward the west since late Pliocene time.

Finally, we would like to emphasize that the study of the migration of the active deformation zones since late Pliocene time will serve to assess the long-term stability of the geological environments in the area.