

Revision of geomorphology and geology of Tokyo Upland and Lowland, based on boring data and precise landform analysis

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Musashino Uplands in Tokyo and the southern Saitama Prefecture, had been investigated by many researchers for the last 90 years. The uplands, with wide area of 45km E -W and 25km N-S, are composed of Musashino and Tachikawa alluvial fans of MIS 5c to MIS 3 and Shimo-sueyoshi marine terraces of MIS 5e, as a type area in the Late Quaternary in Japan.

Recently great advancement in technology changes the research condition also in geomorphology and Quaternary geology.

First, GSI digital elevation model of 5m, is recently opened to the public. It is strongly useful data and tools to analyze precise classification of landforms in densely-developed urban areas like Tokyo. It provides us new maps as Red Relief Map (designed by T. Chiba), new type erosion depth map (by T. Chiba), and Rainbow Color Contour Map (Suginaka et al., 2018), all of them contributed to make a new division of landforms in Musashino Uplands with accuracy of 1 meter.

Second, a great number of digitized boring data and analyzing tools have been opened to the public. We have used more than 50 thousands data in the Musashino Uplands and Tokyo Lowland. These data revealed the underground geology in shallow part (20 to 100 meters in depth) continuously.

Third, tephrochronological studies in southern Kanto Plain have been established. However, in Tokyo area, distant from the source volcanoes, tephra studies were not enough. Moreover, the studied sites located only at the margin of the uplands. Recent progress in tephrochronology brings us to analyze cryptotephra for the age determination of the older fan gravels of research boring cores at the important site of the fan surface.

Those three new research conditions enable us to renew the division of landforms in Musashino Upland and Tokyo lowland.

Fourth, we created a new system using an automated program analyzing geological sequence from a vast number of boring data.

Main characteristics of this approach is to combine new results of computer-supported geomorphological and shallow geological data, with field-based knowledge and analog-type analyses such as a number of geologic profiles.

Keywords: boring data, geomorphology and geology in Tokyo, landform division in Musashino Upland