Study in Spatial Distribution of Sediment Strength in Omiya and north Musashino Uplands

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In order to investigate the *N*-values of underground sediments in Omiya and north Musashino uplands, isopleth maps were drawn using ArcGIS (ver 10. 3. 1, ESRI Japan Corporation). First, the summarized *N*-values data[1)] were referred and picked up the values of 3-m depth intervals. Then, by using the GIS software, each boring point was plotted and made isopleth maps of each 3-m interval. As a result, high *N*- value with the sediments composed by gravel is distributed in Musashino uplands, whereas low *N*-values less than 10 with mud and silt sediments between 24-33m depth in Omiya uplands. Sediment layers existing fossil shells are also pointed out in the original boring core data[1)] in Omiya uplands. The low *N*-value area is corresponded to the distributed area of Kioroshi formation, which deposited during Shimosueyoshi transgression. From these analyses of mapping data, it is concluded that it is important to choose it by not only surface landscapes but also considering the history of landscape development as well as geotechnical parameters such as *N* -values, when we decide the suitable low-cost construction site.

Keywords: N-value, Omiya upland, Musashino upland, Boring core sample, GIS

Response to the uplift of a single channel in mountain rivers: Laboratory experiments

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In considering the development of mountain rivers, it is very important to know about the developmental process and the dynamics of downward erosion and lateral erosion, although these are partially understood so far. A previous experimental study for channel networks described that lateral migration of surface reliefs became dominant after the erosion rate reached the uplift rate on the whole. This report came from the observation though photograph of the entire basin, and studies in individual channel scales are very few so far. The purpose of the present study is to elucidate relative strength of downward and lateral erosion of bedrock river when experienced uplift, using model experiments. We targeted the observation of a single channel for measurements with high accuracy.
Experiments were performed two times under almost the same condition (Experiments A & B). The uplifts were realized by removing weirs of 1cm at the downstream end. Experiment A was carried out for 300 minutes, during which the uplifts were generated when the river bed seemed stable. Meanwhile, Experiment B was continued for 260 minutes, in which the uplifts were actualized at the same timings as Experiment A regardless of the channel state.
The results, with few exceptions, showed that the elevation of the channel bed at any places continued to lower by downward erosion until a knick-point passed through, and thereafter lateral erosion occurred while downward erosion almost ceased.

Keywords: downward erosion, lateral erosion, profile

Transport processes of huge riverbed boulder and landforms of the Miyanoura River in the Yaku Island, southern Japan

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There are huge boulders on the riverbeds of most rivers in the Yaku Island, southern Japan. The Miyanoura River is the most typical river and one of the largest rivers originated in the central part of the island. This study aims to discuss the production and transport processes of such huge riverbed boulders and relationships between the processes and landforms of the basin.
Most part of the Yaku Island, including the central part, is underlain by granitic rocks. The Mitanoura River, whose length is 17 kilometers, flows down in granitic area except the lowest section of 4 kilometers. Maximum diameter of the riverbed boulders is about 10 meters in the upper reaches. It decreases downstream to several tens centimeters as the channel slope decreases. Although uniform granite is underlain by this basin, maximum diameter of riverbed boulders correlates with channel slope. This indicates such boulders are transported by river being affected by sorting process. In the reaches of maximum boulder size being over 5 meters, relative height between ridges and valley bottoms is as large as 500m. There are many landslide scars in the tributary basins which join the Miyanoura River in these reaches. At the junctions these tributaries with steep channel slope develop alluvial cones on the valley floor. The deposits of the riverbed and the alluvial cones include huge boulders with several meters in diameter. Alluvial cone development across the Miyanoura River formed a dam. A dam break during a heavy rain event caused torrential floods and huge boulder transportation.
There is a continuous terrace along the middle reaches of the Miyanoura River. The terrace deposits consist of huge boulders of several meters in diameter. This terrace is not covered with the Koya pyroclastic flow deposits, which was erupted at 7,300 y.B.P. and which covered the valley side slopes around there. The cause of terrace is an important key to solve the cause of the huge riverbed boulders.

Keywords: huge riverbed boulder, sediment transport process, landform, Miyanoura River, Yaku Island, southern Japan

