

Topographic development process of bedrock river: model experiment

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Understanding the evolution of channel topography helps to reproduce past landscape and predict future landscape. Since bedrock rivers are less well studied than alluvial rivers, further study of bedrock river topography is needed. Although the relationship between bedrock erodible and topographical features has been often discussed, both clear relationships are not understood in natural rivers, as various factors change irregularly.

In this study, we investigate the some relationships between complex and various factors through a single channel model experiment that can control the factors that affect the river topography. In addition, we observe the temporal change of the topography and aim to clarify the development process of river. The main controlling factors in this study are topographic uplift and bedrock erodible. The analysis targets are channel width, riverbed gradient, sinuosity, and erosion rate.

The experimental correlation diagram of each factor showed the same distribution as the natural river topography. High erosion rates are showed by steep river beds. The erosion rate tended to be low on the topography with high sinuosity. These distribution trends were showed during the uplift. In this experiment in which the uplift event lasted longer, the sinuosity tended to be lower than in the experiment in which the uplift event was short. On the other hand, the bed slope did not change significantly due to the uplift. Bed slope may not have a strong dependence on uplift event.

In the future, we will continue experiments that combined other bedrock and uplift patterns to study the effects of both.

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