B15

Studies of High Resolution Morphodynamics and Floodplain Sedimentary Environments

○ Ryoukei Azuma, Hideo Sekiguchi, Tetsu Ono

1. Introduction

Understanding the morphodynamics and flood plain sedimentary environments is therefore fundamental to estimation of floodplain response to future evolutions in environmental systems and human development. Many studies focus in particular on descriptive studies of river-channel evolution and their mechanism. Most of these established physical models enable estimation of erosion process of experimental scale when sediment is non-cohesive material. There is little study which examined the actual scale phenomena, because studying the morphodynamics and sedimentary environments of floodplain is fraught with difficulty. Data collection in actual-scale of bank erosion is often difficult because of poor opportunity, issues of scale, and high cost of topographical measurement.

In this study, bank erosion of low-water channel at 43.0km from river mouth in Uji River was selected as study area. We performed the digital photo-theodolite survey periodically at this site and high-resolution topography and quantitative assessments of sediment fluxes were performed.

2. High-resolution digital geomorphometry

The geomorphometry of outcrop was performed twice. Azuma et al. (2006) performed this geomorphometry and topographical features associated with levee breaching were succeeded in high-resolution measurement. First measurement was carried out on January 17, 2006, and covered the domain from 44.0k to the 43.0km distance label, as a result a total of 5307 points were identified. Second measurement was carried out on October 17, 2006. The measuring region was about 250m from 43.0km, and more detailed topographical features measurement was performed. As a result, a total of 5307 points were identified.

3. Sediment volume analysis

From above-mentioned two measurement results, the erosional sediment volume was quantified using a GIS. The volume of erosional sediment was yielded from January, 2006 to October was calculated as 3000 m^3.

4. Reality of bank erosion process

The shift of floodplain edge line and its receding rate is discussed mainly. In this section, it considered about a relation with bank erosion not only about flood discharge and duration but about hydraulic quantities. These hydraulic quantities are calculated from water stage and discharge data of Yodo and Mukaijima observatory.

The relevance of stream power at the time of flooding and bank erosion is not only examined, but it considers also including the floodplain sedimentary environments such as soil moisture and cohesive. Moreover, the past research data of Fujita *et al*. (1983) is also integrated, and the erosion process of scour of root-collapse of cave-rundown by stream is clarified.

Azuma, R., Sekiguchi, H. and Ono, T. (2006): Performance of levee system at flood stage, Annuals of Disas. Prev. Res. Inst., Kyoto University, No.49C, pp.225-235.

Fujita, Y., Muramoto, Y. and Miyasaka, H. (1983): Side bank erosion in rivers, Annuals of Disas. Prev. Res. Inst., Kyoto University, No.26, B-2, pp.427-444.