

## Sediment movement and collapse of bank protections by a series of large flood events at the Sendai River, Tottori, southwest Japan

\*Yoshinori Kodama<sup>1</sup>, Kento Takemoto<sup>2</sup>

1. Faculty of Agriculture, 2. Hyogo Prefecture

In recent two years, large flood events more than 15 year-occurrence interval happened in a row at the Sendai River ( $A_d=1,190 \text{ km}^2$ ,  $L=52 \text{ km}$ ), southwest Japan. We surveyed recording artificial bank damages and sediment movements to build bars. We also analyzed satellite images for pre-events, middle, post events. The results show that the Sendai River could be divided into three sections, except uppermost 6.6 km reach: i) 6.6-11.8 km: river bed sediments were washed away to be bedrock exposure, ii) 11.8-31.0 km: alternate bars with small wavelength (less than 1000 m) were formed and iii) 31.0-48.4 km: alternate or multiple bars with larger wavelength (less than 4000 m) were formed, some of them were covered by vegetation. Many sites of artificial bank protection collapse were observed in bedrock exposure reach, where basement of artificial bank protection lost support by removing sediments. The other many sites of bank collapse were in adjacent points of small wavelength (less than 800 m) and high in relief (c.a. 2m) alternate bars, where convergent flood flow occurred scouring of river bed material.

Keywords: Large flood events, collapse of bank protection, bedrock exposure, alternate bar, satellite image, 2018 torrential rain in western Japan