



## **Analysis of water-sediment connectivity along forest road network based on UAV-SfM and hydrological measurements**

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Forest road enhances water and sediment yield from forest hillslope. In order to assess the influence of forest road network on connectivity on water-sediment dynamics, we conducted a hydrological measurement of water-sediment discharge and UAV-SfM-based survey of surface micro-topography along forest road in a watershed of coniferous forest plantation. water and sediment discharge were measured at three different locations with different road length in order to determine dominant processes on water and sediment discharge along forest road and neighboring forest hill slope. Furthermore, UAV-SfM measurement was conducted to determine temporal changes of surface topography of forest road, and water flow direction was computed by using a high resolution DSM (Digital Surface Model). The results of this study indicated that road length of the drainage area and rainfall intensity was a crucial factor controlling water discharge, however such effects were rather obscure for sediment yield from forest road. The analysis of UAV-SfM measurement suggested that surface erosion and sediment deposition on forest road changed connectivity of water-sediment dynamics along forest road network. Furthermore, contribution of return-flow from the upslope forest roads may enhance surface runoff generation and slope erosion along forest roads in downslope side. These results indicated that combination of conventional hydrological measurements and the UAV-SfM survey help further understanding of connectivity in water-sediment dynamics along forest road network in the watershed of Japanese coniferous plantation.