

11:00-12:30 Session RS08: Sediment and River Engineering

CHAIRS: [Ho Sung Yu](#), [Eun-kyung Jang](#) and [Ichiro Kimura](#)

LOCATION: [Room 206](#)

11:00 [Doeon Kim](#), [Changseong Kim](#), [Hyoseop Woo](#), [Yoonsu Shin](#) and [Sung-Uk Choi](#)

Sensitivity Analysis and Performance Test of Total Sediment Load Formulas for Major Rivers in Korea

PRESENTER: [Yoonsu Shin](#)

ABSTRACT. The impacts of climate change are increasingly evident worldwide, resulting in recurrent floods and droughts. In rivers, sediment load is expected to increase with increasing flood discharge. An increase in sediment load alters river environments, which in turn affects the safety of river infrastructure and the health of river ecosystems. Sediment Rating Curves (SRCs) obtained from field measurements are widely used in practice, but rarely have physical meanings. In contrast, total sediment load formulas, based on empiricism and experiments, do not adequately reflect localities.

This study conducted a sensitivity analysis of five widely used formulas for total sediment load. Yeosu Station on the Han-gang River is selected as the study site. The applied formulas include the Engelund–Hansen, Ackers–White, Yang, Brownlie, and Karim formulas. Discharge, median grain size of bed materials, and bed slope are selected as independent variables. The sensitivity analysis results indicate that the sediment load is most sensitive to discharge, followed by bed slope and median grain size. Sediment load responds to these independent variables consistently with Lane’s relationship. Performance tests of proposed SRCs and five total sediment load formulas are also conducted for the five major rivers in Korea using data measured in 2024, provided by the Korea Institute of Hydrological Survey. According to the performance test results, SRC performs best in the Han-gang River and Yeongsan-gang River. The Engelund–Hansen and Karim formulas show the best performance in predicting total sediment load in the Nakdong-gang River and Seomjin-gang River.

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