

Abstract Submitted
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Large-eddy simulation of flow past a real-life stream restoration structure¹ SEOKKOO KANG, FOTIS SOTIROPOULOS, University of Minnesota — We carry out high-resolution large-eddy simulation (LES) of flow around a rock vane, which is a widely used stream restoration structure. Mean velocities and turbulence statistics collected downstream of the rock vane installed in a laboratory flume are compared with the LES results. The comparisons demonstrate that the LES is able to accurately predict the measured mean velocities and turbulence statistics. The simulation shows that the rock vane effectively directs the oncoming flow away from the structure and creates a reduced velocity region in the downstream region. The computed results also reveal that the rock vane creates strong secondary helical flow that directs the near-bed flow toward the sidewall to which the rock vane is attached. This finding points to the conclusion that the downstream secondary flow can create deposition of sediments near the sidewall in a mobile bed condition, which can serve as an important mechanism for protecting near-bank scour in natural streams.

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Seokkoo Kang
University of Minnesota

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