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Countermeasure of river bend scour using a combination of submerged vanes and riprap

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### **ACCEPTED MANUSCRIPT**

### Countermeasure of river bend scour using a combination

of submerged vanes and riprap

# Countermeasure of river bend scour using a combination of submerged vanes and riprap

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#### Abstract

A series of laboratory flume experiments were done in a large-scale 180° bend with noncohesive sediment to find optimal or effective protection works at a bend. Detailed study of the scour and flow field dynamics with and without protection works was done. Spatially dense, high frequency velocity data were collected and analyzed to describe the pattern and magnitude of three-dimensional (3D) velocity throughout the bend. Characterizing the role of flow field dynamics on the pattern of deposition and erosion through experimental

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