

## Analyzing the formation of scour due to a turbulent wall jet along a non-cohesive sediment bed

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**ABSTRACT.** Scour in non-cohesive sediment beds is an issue in such engineering projects as dam spillways, bridge piers, and shallow maritime navigation locations. Significant scour can lead to undermining of hydraulic structures and altered boundary flow along the bed. Scour can also be beneficial as a natural process for aquatic life or harnessed by humans to dredge navigation channels. The objective of the study is to investigate the formation of scour holes due to a submerged two-dimensional wall jet. The information gathered from these experiments is then analyzed for relationships in scour growth rates and equilibrium scour dimensions. Experiments are conducted with a 0.91-meter long sediment bed composed of uniform sand sized particles ranging from 250-750 microns. Experimental flows range between 40-150 LPM. Incremental scour data is collected by profile plotting. All experiment runs are then fitted to a dimensionless scour profile relative to scour dune location. From the dimensionless scour profiles rigid boundary sediment beds are constructed so that the flow along the scour can be analyzed. Flow characteristics within the scour are obtained with Particle Imaging Velocimetry (PIV). PIV analysis will be helpful to determine parameters for use in established sediment transport equations. Data collected in these experiments will be used to develop sediment transport equations for scour predictions.