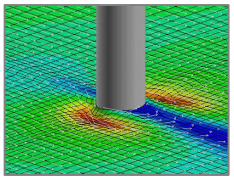
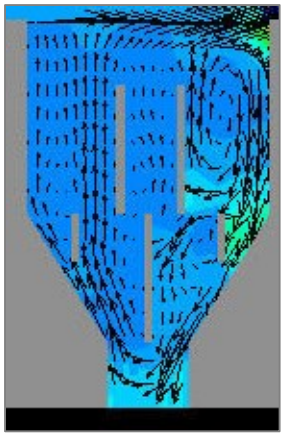
Introduction



Computational Fluid Dynamics (CFD) provides an accurate method for performing detailed flow analyses in both air and water environments. CFD has been effectively applied to many areas in environmental engineering related to sedimentation and erosion processes.

Erodibility Testing



"CFD calculations of flow in a straight flume for sediment erodibility testing. The simulations allowed for improved post-processing of the erosion data collected and better understanding of scour pit formation that is sometimes found in the flume's test section.

Knowledge of the erodibility of cohesive sediments (the rate of erosion as a function of hydraulic conditions) is necessary for conducting rate and transport studies of particle-bound contaminants and for developing sediment budgets. Unfortunately, cohesive sediment erodibility is not easily predictable based on environmental data (McCave 1984; Aberle et al. 2004)." *

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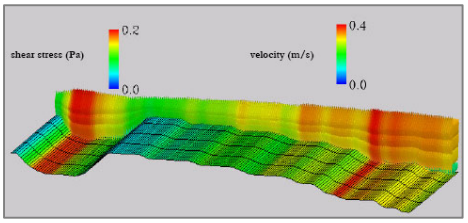
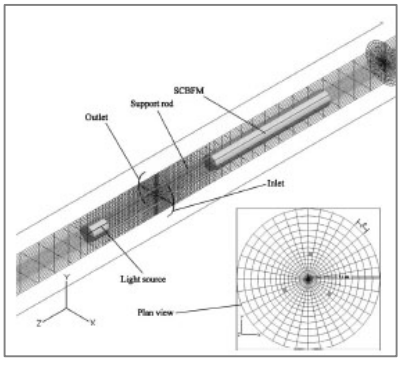
Riverbed Erosion



Sandia National Laboratories utilized used CFD to model local erosion from the stream bed and river banks of the Pecos River. The Figure below is an example of the CAESIM moving grid erosion model (shear stress showing erosion potential)

Ground water Flow



"This paper reports on experiments and simulations of subsurface flow from a slotted acrylic tube deployed in a sand-tank flow chamber for two different purposes. In the first instance, the slotted tube is used to represent a single fracture intersected by an uncased well. In the second instance, the slotted tube is used to represent a multi-slot well screen within a porous medium. In both cases, the scanning colloidal borescope flow meter (SCBFM) measures ground water velocity within the well by imaging colloids traveling through a well to measure their speed and direction. Measurements are compared against CFD simulations."

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