

CFD Modeling of Turbidity Current Deposition (PDF)

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Title: CFD Modeling of Turbidity Current Deposition

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摘要: Simulation of the flow and deposition from a laboratory turbidity current, in which dense mixtures of sediment move down a narrow, sloping channel and flow into a large tank. SSIIM CFD software is used to model 3-D flow and deposition. SSIIM predicts the height of the accumulated mound to within 25% of experimental values, and the volume of the mound to 20%-50%, depending on the concentration of sediment and slope of the channel. The SSIIM predictions were consistently lower than experimental values. In simulations with initial sediment volumetric concentrations greater than 14%, SSIIM dumped some of the sediment load at the entry gate into the channel, which was not the case with the experimental runs. This is likely due to the fact that the fall velocity of sediment particles in SSIIM does not vary with sediment concentration. Further simulations of deposition from turbidity currents should be attempted when more complete experimental results are available, but it appears for now that SSIIM can be used to give approximate estimates of turbidity current deposition.

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