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Modelling Submarine Turbidity Currents ALEXANDER GOATER, ANDREW J. HOGG, Centre for Environmental and Geophysical Flows, University of Bristol — When a large scale pyroclastic flow enters the ocean it leads to the spreading of sediment across the deep ocean through particle laden flows known as turbidity currents. Turbidity currents are driven by gravitational forces associated with a density difference caused by the presence of suspended particles. This generates a flow which transports the suspended particles, but which progressively slows as they sediment to the underlying boundary. We adopt a shallow layer model in which vertical accelerations are neglected and employ a three equation system that expresses the conservation of fluid and particulate mass and formulates a balance of momentum for a current flowing down an incline. Importantly we include the effects of entrainment of surrounding fluid into the flow. Solutions are constructed using numerical means and they reveal the strong dependence of run out length on the rate of entrainment. Further, the prediction of the distribution of the deposit from the flow compares favourably with field data from the July 2003 event from Soufrière Hills volcano, Montserrat.

Alexander Goater
Centre for Environmental and Geophysical Flows, University of Bristol

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