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## Quantifying input uncertainty in models of volcanic flows

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Mathematical simulations of volcanic mass flows supplement field deposit studies, providing data from which to make predictions of volcanic hazards. Several parameters and functions must be specified upon input, in order to start the simulation. These inputs include the total volume of the mass flow, the initial direction of the flow, friction and dissipation factors, and the terrain over which the mass moves. These inputs are often poorly characterized, or are known to be inaccurate. These inaccuracies affect the output results of the simulations. Here we provide a methodology to account for uncertain inputs and the effect of uncertainty on outputs, in order to provide a quantitative measure of hazard at locations downstream from the volcano. This approach draws on insight from the geo-science community, methods of high performance computing, and novel use of Bayesian statistics and mathematical modeling.