Department of Applied Computational Mathematics and Statistics Colloquium

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will give a lecture entitled:

Efficient Use of Geophysical Simulations for Developing Probabilistic Hazard Maps

Abstract

Large granular volcanic events—pyroclastic flows—are rare yet potentially devastating for communities situated near volcanoes. Proper assessment of such hazards must include scenarios that are larger in volume than any previous events. This task inherently requires a combination of physical and statistical modeling as well as large scale computations. Accounting for these multiple sources of uncertainty is crucial in the hazard assessment process. Furthermore, one must carefully handle the rare nature of the most dangerous events to keep probability calculations computationally feasible. To this end, statistical model surrogates prove a powerful tool in developing probabilistic hazard maps. Specifically they enable a fast solution to the inverse problem of 'which physical scenarios lead to inundation'. With this knowledge in hand, probabilistic hazard maps can be computed cheaply for any statistical models of physical scenarios, e.g., as new data on flow volume/frequency or expert opinion becomes available. As a test case, we produce probabilistic hazard maps for the area surrounding the Soufriere Hills volcano on the island of Montserrat.

Thursday, December 6, 2012
4:00 p.m. to 5:00 p.m.
127 Hayes-Healy Center