AN ENGINEERING SOLUTION TO FLASH FLOOD FORECASTING WITH GLOBAL APPLICABILITY

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Flash floods constitute one of the deadliest and costliest natural disasters worldwide. Steep terrain, excessive antecedent rainfall and thin soils conspire to create conditions highly conducive to flash flooding. The landfall of Hurricane Mitch on Honduras in late 1998 is a recent example of widespread flash flood occurrence with dire consequences for Central America. Just from this single landfall, the damage exceeded 10 billion US dollars with more than 7,000 lives lost. *In this presentation, we address this need with an engineering solution for the design of early flash-flood warning systems world-wide based on readily-available global databases and remotely sensed and on site data.*

Present day satellite technology and attendant methods for image interpretation, global digital spatial databases, and advances in spatially extensive hydrologic modeling make a regional flash-flood early-warning system with high spatial resolution feasible world wide. The envisioned system has the capability to provide information on the likelihood of flooding of small streams over large regions on the basis of global data at the early stages of a developing hazardous situation. It can also ingest additional regional and local information (as available) to improve estimates of small-catchment flash-flood occurrence.

An important component of the regional system is the development of the flash flood potential of small basins of a large region in saturated or near-saturated soils. This so called threshold runoff information is obtained from geomorphologic theories of catchment response and from present-day digital spatial data. It is used to produce estimates of flood-inducing rainfall over a given duration for the small catchments of a given region. The presentation discusses validation results obtained from regions with adequate data coverage, and issues associated with application in ungauged areas.