



## **Multi-resolution adaptive data collection prioritisation for multi-risk assessment**

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The distribution and amount of potential losses due natural hazards are continuously, and sometimes abruptly varying, spatially and temporally. Changes in damage distribution are dependent both on the specific natural hazard (for instance flood hazard can depend on the season and on the weather) and on the evolution of vulnerability (in terms of variation in size and composition of the exposed assets). Considering space and time, moreover, the most appropriate scales at which the changes occur have to be taken into account. Furthermore, spatio-temporal variability of multi-risk assessment is depending on the distribution and quality of the information upon which the assessment is made. This information is subject to uncertainties that also vary over time, for instance as new data are collected and integrated.

Multi-risk assessment is therefore a dynamical process aiming for a continuous monitoring of the expected consequences of the occurring of one or more natural events, given an uncertain and incomplete description of both the involved hazards and the composition and vulnerability of the exposed assets.

A novel multi-resolution, adaptive data collection approach is explored, which is of particular interest in countries where multi-scale, multi-risk assessment is sought but limited resources are available for intensive exposure and vulnerability data collection. In this case a suitable prioritisation of data collection is proposed as an adaptive sampling scheme optimized to trade off between data collection cost and loss estimation uncertainty. Preliminary test cases will be presented and discussed.