



Multi-risks study in the urban area of Mulhouse (East of France)

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Risk, as a multi-disciplinary object, has been studied for many years. However, most of these studies focus on only one hazard; few of them consider several risks or the potential interactions between them. Some interactions could be observed in the urban area of Mulhouse (East of France), which is exposed to seven different hazards. The double objective of this study is (1) to assess the impact of an earthquake on the urban area of Mulhouse and particularly on some dangerous industries locations and (2) to develop a decision support system to assist local authorities and emergency services in their mitigation of risks activities.

In this presentation, we propose a methodology based on three steps. First, efficient risks mitigation implies to have a good knowledge of risks at a local scale. This requires evaluating the different hazards and the vulnerability of buildings and people (including social vulnerability, related to perception of risks). Second, we identify the potential interactions between risks, *i.e.* the technological accidents produced by an earthquake. The methodology developed in this study is based on both the physical vulnerability of buildings to earthquakes and the function of those buildings, regarding technological hazard. The results show two potential domino effects following an earthquake. Finally, a multi-risks geographic information system (GIS) is presented as a decision-making support for local authorities and other stakeholders. The results of this study could be integrated in urban land planning by asking for the re-reinforcement of the solidity of the buildings or the change of the dedicated function when several hazards are identified. Moreover, all the stakeholders (civil protection, rescue services, decision makers. . .) involved in the management of a catastrophe could query the GIS information in order to locate the districts where specific rescue actions should be planned.