



Sinkhole risk analysis from the point of view of a public building insurance, the case of Vaud County (Switzerland)

P. Nicolet (1), M. Choffet (1), M. Jaboyedoff (1), B. Lauraux (2), J.-L. Lance (3), and E. Champod (4)

(1) University of Lausanne, IGAR, Risk analysis group, Lausanne, Switzerland (marc.choffet@unil.ch), (2) Bertrand Lauraux SA, Bex, Switzerland, (3) Etablissement Cantonal d'Assurance, Pully, Switzerland, (4) Canton de Vaud, Département de la Sécurité et de l'Environnement, Secrétariat Général, Unité Dangers Naturels, Lausanne, Switzerland

Natural hazards are being mapped in the Vaud County and sinkhole hazard is part of this process. A preliminary hazard map has already been made based on the sinkholes occurrences and on several other parameters such as rocks types, proximity of major faults and closed basins. The detailed hazard map essentially based on the occurrence of sinkholes is in process. This map will influence the landuse planning. Presently, the public building insurance is covering the damage costs due to all natural hazards that are being mapped except sinkholes. For the sake of consistency and due to political pressure, the insurance company wants to integrate this phenomenon in its insurance coverage. This study aims to assess the potential damage costs to buildings induced by this decision.

Karstic process is active in two regions in the County. The first one, namely the Folded Jura, is composed of Jurassic and Cretaceous Carbonate rocks. The second one, the Prealpine region, is composed of both Carbonate and evaporitic rocks. Even if the cavities in carbonate rocks can cause difficulties during the buildings construction, the karst development in these rocks is relatively slow and, as a result, the expected damage costs to buildings is relatively low. In contrast, the evaporitic rocks are likely to cause significant subsidence or sudden collapses at human scale and thus damage the buildings. Therefore, our study is focused on the region where this rock type occurs.

It results that many buildings, i.e. more than 10'000, are concerned according to the preliminary hazard map. However some of these buildings are in zones with very low potential. Based on estimated frequencies of collapsing events and subsidence rates, the potential damage cost is estimated. Furthermore, the number of potential claims is also considered in order to know the expected additional work for the insurance company. Careful attention is also given to the potential development of building zones. In addition, the project gives guidelines for the insurance company, focusing on structural measures reducing buildings vulnerability.