

## Integrated risk management and communication: case study of Canton Vaud (Switzerland)

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Canton Vaud's history is marked by events that remind us that any territory may have to cope with natural hazards such as devastating floods of the Baye and the Veraye rivers in Montreux (1927), the overflowing of the Rhône by dam failure (1935), the mud flow of Pissot (1995) and avalanches in the Prealps (1999). All of these examples have caused significant damage, and sometimes even fatalities, in the regions of Canton Vaud.

In response to these new issues, the Swiss Confederation and the local authorities of the Canton decided to implement an integrated management policy of natural risks. The realization of natural hazards maps was the first step of the integrated management process.

This work resulted in more than 10'000 maps and related documents for 94% of the municipalities of the Canton, covering 17% of its total surface. From this significant amount of data, the main issue is to propose a relevant communication and to build an integrated risk management structure.

To make this available information relevant for end users, the implied teams worked to realize documents and tools for a better understanding of these data by all stakeholders.

The first step of this process was to carry out a statistical and geographical analysis of hazard maps that allows identifying the most exposed areas to natural hazards. An atlas could thus be created. Then, continued under this framework, several topics have been discussed for each identified risk.

The results show that 88 of 318 municipalities in Canton Vaud have at least a high hazard level on their territory, 108 with a moderate hazard level, 41 with a low level and 8 with a residual level. Only 73 of 318 municipalities remain with a minimum or zero hazard level.

Concerning the type of hazard considered, 16% of the building zones are exposed to floods, 18% to mud flow, 16% to deep landslides, 14% to spontaneous surface landslides, 6% to rockfall, 55% to rock collapses and less than 5% to avalanches.

As the national policies require to take into account the risk at the building scale, further analysis on the buildings have been made. 1'154 buildings are exposed to a high hazard level, while 8409, 21'130 and 14'980 buildings are exposed to a moderate, low and residual hazard level respectively.

This paper addresses the complexity of the realization of the hazard map products of the Canton Vaud, particularly through the statistical analysis and the difficulties encountered for data availability and quality at the building scale. The authors highlight the necessary processes to build a robust communication for all the implied stakeholders of risk management in a dynamic and changing area through the example of the Canton Vaud.