



HAL
open science

Evaluation of future impacts of global change in mountainous areas with a a novel multi-risk assessment web-tool

Gilles Grandjean, Séverine Bernardie, Anne Puissant, Jean-Philippe Malet, Thomas Houet, Franck Bourrier, Gilles Arnaud-Fassetta

► To cite this version:

Gilles Grandjean, Séverine Bernardie, Anne Puissant, Jean-Philippe Malet, Thomas Houet, et al.. Evaluation of future impacts of global change in mountainous areas with a a novel multi-risk assessment web-tool. EGU General Assembly 2019, Apr 2019, Vienne, Austria. hal-02081916

HAL Id: hal-02081916

<https://brgm.hal.science/hal-02081916v1>

Submitted on 27 Mar 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Evaluation of future impacts of global change in mountainous areas with a novel multi-risk assessment web-to

Gilles Grandjean (1), Severine Bernardie (1), Loic Thomas (2), Anne Puissant (3), Jean-Philippe Malet (4), Thomas Houet (5), Franck Bourrier (6), and Gilles Arnaud-Fassetta (7)

(1) BRGM, Orleans, France (g.grandjean@brgm.fr), (2) ANTEA Group, Orléans, France (loic.THOMAS@anteagroup.com), (3) LIVE, University of Strasbourg, Strasbourg, France (anne.puissant@live-cnrs.unistra.fr), (4) EOST, Strasbourg, France (jeanphilippe.malet@unistra.fr), (5) University of Rennes 2, Rennes, France, (thomas.houet@univ-rennes2.fr), (6) IRSTEA, Grenoble, France (franck.bourrier@irstea.fr), (7) PRODIG, University Paris Diderot, France, (gilles.arnaud-fassetta@univ-paris-diderot.fr)

Natural hazards are usually examined and managed separately. Only few studies show multiple threats analyzes where the overall hazards and/or risks are assessed jointly. When considering such joint analyses, numerous challenges and difficulties arise, since multi-risks approaches need to model mountain hazards and exposure of elements in an integrated way while being compliant with observations. The physical processes, mainly governed by hydro-meteorological triggers, increase the pressure on social or natural systems, producing important modifications on the environment. To cope with this situation, short-term proactive adaptation plans are needed. To address such issues, technical specialists covering physical, social, and economic aspects of the problem, having experiences of mountainous environments and being familiar with perspectives of development of these territories at a different scale must be solicited. The model proposed in our work was specifically design to take into account the particularities of mountainous areas and to implement these multidisciplinary issues. The objective of this work, implemented in the French national project SAMCO (Society Adaptation for coping with Mountain risks in a global change COntext), was to identify key factors (e.g., exposure scenarios, hazard levels, and impacts on stakes at risks) to identify risk management strategies adapted to reduce the possible impacts (landslides, rockfalls, floods) of global changes, until the 2100 horizon. To fulfill this goal, we proposed a methodological framework able to bring together different scientists working on environmental and social sciences for developing necessary tools able to assess risks in mountainous areas, for the present, but also for future periods. The main result of the SAMCO project was to design and disseminate the results through a web-platform. As presented in the following, we developed this platform thanks to a web-architecture based on Geographical Information Systems (GIS) and communication technologies, which are able to manage multi-geohazard/risk impact maps referring to the different socio-economical pathways. This web-tool offers to the deciders the possibility to choose between the best strategies improving the resilience of the territory for which they are responsible.