

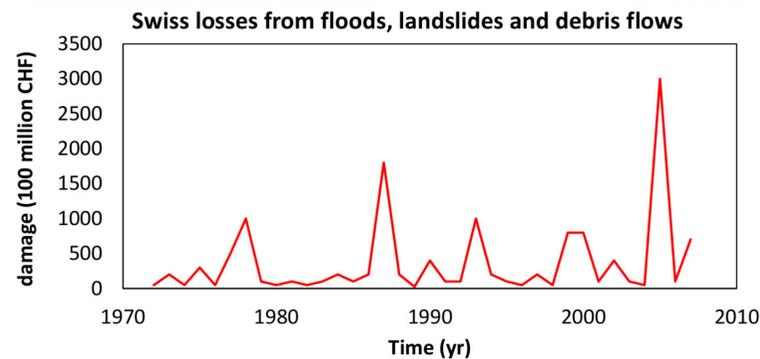
Risk and Resilience Cluster: Addressing challenges of greater mountain regions from a multi-dimensional and dynamic perspective

Jorge Ramirez, Margreth Keiler, Tina Haisch, Renate Ruhne, Heike Mayer, Chinwe Ifejika Speranza, Olivia Martius, Andreas Heinimann, Stephan Rist
University of Bern, Institute of Geography, Bern, Switzerland

1. Background

Mountain regions face severe risks, insecurities and crises in the context of extreme events and disasters. If such communities experience high economic and social losses during a disaster, the question arises **why there is so little progress in the ability to mitigate and adapt to natural hazards?** We will address this question by:

- Understanding the **coupling of human and natural systems** and the role of couplings in preventing a hazard from becoming a disaster.
- Improve the understanding of the temporal evolution of **risk and community resilience**.



Sources: Keystone/Alessandro della Valle, Aargau Dept of Construction, Transport and the Environment, "The floods of 2005 Switzerland"

3. Study Sites

Our **coupled human-landscape model** will be developed at sites in Switzerland, with a focus on catchments and communities in Canton Bern. This includes sites in mountainous regions and hilly countryside. We will also apply our models to locations in the broader Alps region.

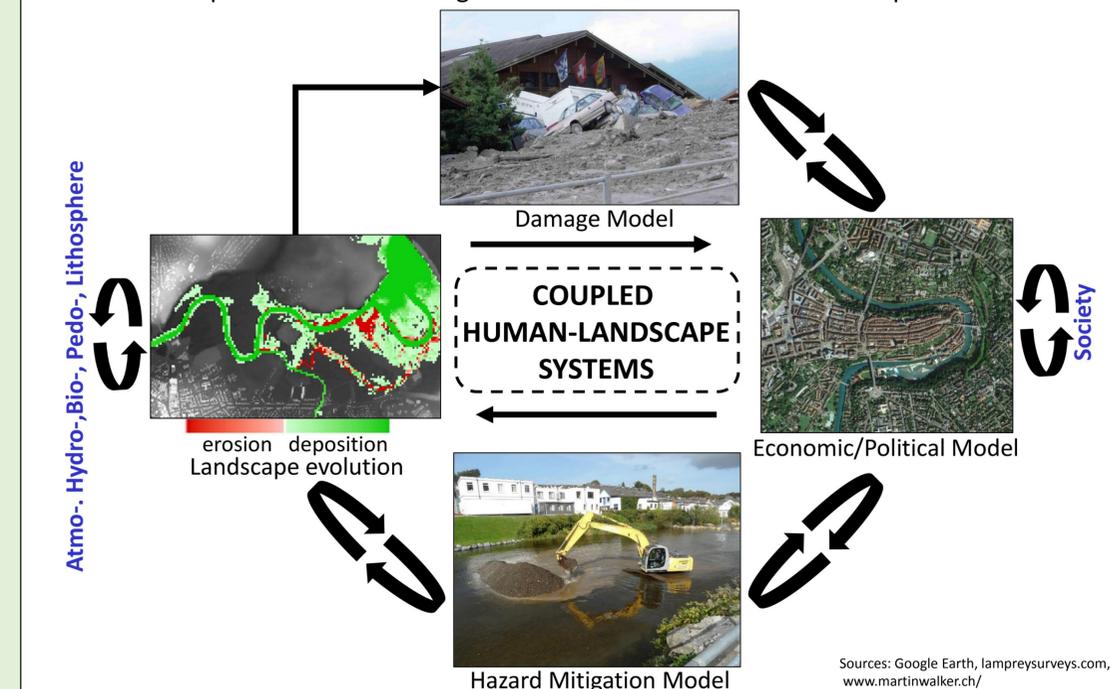


2. Aims and Objectives

Our **aim** is to integrate existing knowledge on **risk and community resilience** into a new framework represented by a **coupled human-landscape system**.

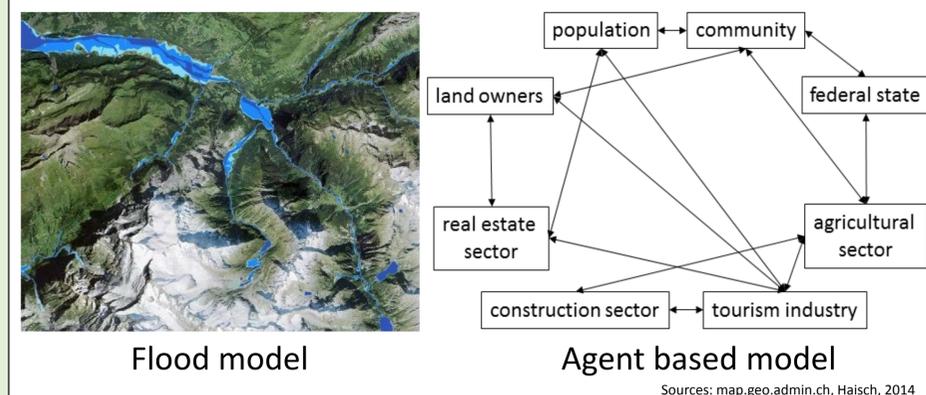
Objectives:

- Develop a conceptual model addressing the dynamics of **risk and community resilience** in mountain areas with emphasis on couplings between humans and the landscape.
- Implement the conceptual model as a fully **coupled human-landscape** computer model.
- Use the coupled model to investigate the resilience of communities exposed to hazards.



4. Modelling

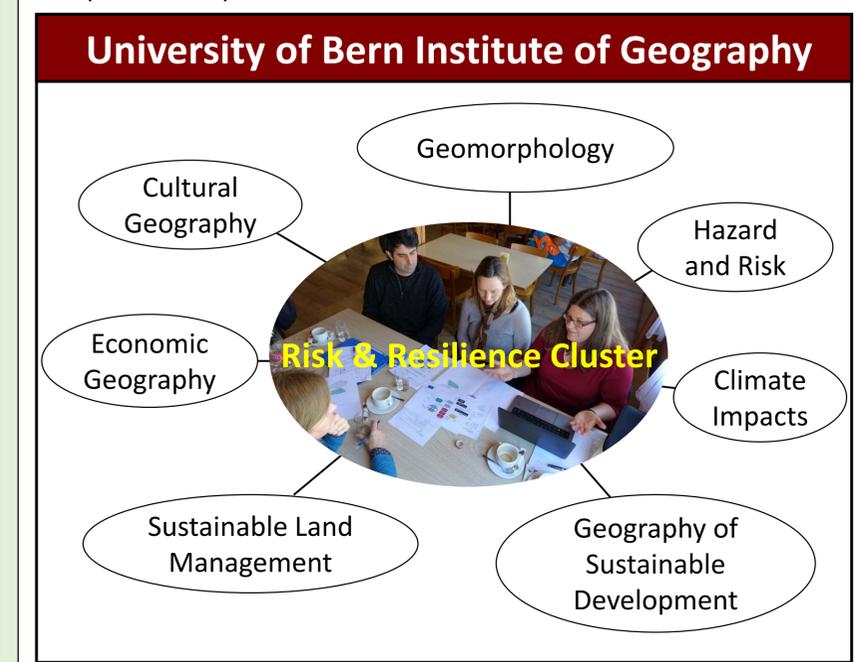
Our project is adopting a **coupled modelling approach** because various factors influence the location of human settlements and their exposure to mountain hazards. Society, politics, and technology can mitigate or exacerbate hazards and these actions strongly influence human settlement. Thus we intend to model the interplay between physical and socio-economic processes in Alpine communities over decadal time scales. Our model scenarios will include hazards such as **debris flows** and **floods**.



We will model how **communities at risk** adapt and mitigate these mountain hazards. Our model will capture major shifts from agricultural to service-based economies in mountain communities and stressors like economic crisis, depopulation, restrictions on construction, and climate change. Our models will contain linkages between actors in communities and determine which processes and adaptive strategies lead to more or less resilient communities.

5. Team

The **Risk and Resilience cluster** brings together the knowledge and expertise across the **University of Bern Institute of Geography** and aims to improve the understanding of risk and overcome the barriers to increasing community resilience to disasters. Our team is composed of experts in:



Contact: jorge.ramirez@giub.unibe.ch
www.geography.unibe.ch/research/risk_amp_resilience_cluster/index_eng.html