



Research towards improved management of natural disasters including strategies to reduce cascading effects

Elisabeth Schoepfer (1), Jörn Lauterjung (2), Heidi Kreibich (2), Natalja Rakowsky (3), Michael Krautblatter (4), Daniel Straub (5), Christoph Stasch (6), Stefan Jäger (7), Kim Knauer (8), Stefan Greiving (9), Christian León (10), Harald Spahn (11), and Torsten Riedlinger (1)

(1) German Aerospace Center (DLR), German Remote Sensing Data Center (DFD), Germany (elisabeth.schoepfer@dlr.de; torsten.riedlinger@dlr.de), (2) Helmholtz-Zentrum Potsdam, Deutsches GeoForschungsZentrum GFZ, Potsdam, Germany (lau@gfz-potsdam.de; kreib@gfz-potsdam.de), (3) Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Bremerhaven, Germany (Natalja.Rakowsky@awi.de), (4) Technische Universität München, Chair of Landslide Research, Munich, Germany (m.krautblatter@tum.de), (5) Technische Universität München, Engineering Risk Analysis Group, Munich, Germany (straub@tum.de), (6) 52° North Initiative for Geospatial Open Source Software GmbH, Münster, Germany (c.stasch@52north.org), (7) geomer GmbH, Heidelberg, Germany (sj@geomer.de), (8) EOMAP GmbH & Co. KG, Seefeld, Germany (knauer@eomap.de), (9) plan + risk consult – Prof. Dr. Greiving & Partner Ingenieurgesellschaft für Raumplanung und Umweltforschung, Dortmund, Germany (greiving@plan-risk-consult.de), (10) DIALOGIK gemeinnützige Gesellschaft für Kommunikations- und Kooperationsforschung mbH, Stuttgart, Germany (leon@dialogik-expert.de), (11) HS Consult, Apen, Germany (harald.spahn@yahoo.de)

In recent decades, the risk to society due to natural hazards has increased around the globe. To counteract this trend, an efficient risk management is necessary, for which reliable information is essential. However, most of the existing hazard and risk information systems in practice address only individual components within the complex risk assessment chain, as for instance focusing on specific hazards or simple loss measures. Complex interactions, such as cascading effects, are typically not considered, as well as many of the underlying sources of uncertainty. This can lead to incomplete or underestimated assessments of risk, which in turn might hinder the undertaking of efficient prevention and mitigation measures and ultimately even decrease the resilience of the exposed communities.

The German research project RIESGOS (Multi-risk analysis and information system components for the Andes region) will tackle these issues and elaborate novel scientific approaches related to the assessment of multi-hazards compound risk, including dynamic multi-hazard exposure and vulnerability analysis, aimed at the modelling of cascading and interaction effects for the Andean region in Chile, Ecuador and Peru.

Modular, interactive web services will be designed and demonstrated in a flexible and scalable multi-risk information system. The prototype demonstrator platform shall allow end-users from civil protection and disaster management authorities to simulate and analyse complex compound risk scenarios with the ultimate goal of risk reduction and enhanced disaster management. The project team is considering scenarios for floods, landslides, volcanic eruptions, earthquakes, tsunamis and their mutual dependencies from the perspective of ‘what would happen if...?’. This scenario-based approach can be integrated into a probabilistic risk assessment framework to ensure the cost-effectiveness of recommended strategies.

The process is supported by the development and application of new approaches on risk communication. Guidelines for the integration of multi-risk information into land use planning and emergency response plans are also going to be developed and tested for their applicability. The RIESGOS project is cooperating with South American research partners and will be guided by the needs of the potential users and the practical applicability.

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