

## Extreme geohazards: Reducing the disaster risk and increasing resilience

*Extreme hazards -- rare, high-impact events -- pose a serious and underestimated threat to humanity*

European Science Foundation sponsored white paper.

Coinciding with the 200<sup>th</sup> anniversary of the Tambora volcanic eruption scientists today released their white paper on Extreme Geohazards at the European Geophysical Union Symposium in Vienna Austria.

American scientist Dr. Deborah Brosnan (Virginia Tech and UC Davis), one of the authors told the audience. "Imagine we are at this meeting 200 years ago today. We would be sitting here discussing hazards having no idea that in Indonesia, Mount Tambora had erupted and that 500 million tonnes of sulphur dioxide had just been ejected into the atmosphere. Each of us is about to face an unprecedented disaster, a summer where the washing freezes on the clotheslines, where landslides and droughts plague Europe, crops fail and starving bands of refugees are forced to roam the land in search of food." She continued "In the past 200 years we've made incredible advances in hazard science. Today we would know immediately if a volcano erupted on the other side of the world. But would we be better prepared to deal with the global impacts of the disaster, the crop failures or the disruption to trade and commerce. No. We are poorly prepared for an extreme event" she said. "And we need only look at what happened in the much smaller and geologically minor eruption of Eyjafjallajökull Iceland in 2010 as evidence".

Extreme hazards - rare, high-impact events - pose a serious and underestimated threat to humanity. The extremes of the broad ensemble of natural and anthropogenic hazards can lead to global disasters and catastrophes. Because they are rare and modern society lacks experience with them, they tend to be ignored in disaster risk management. While the probabilities of most natural hazards do not change much over time, the sensitivity of the built environment and the vulnerability of the embedded socio-economic fabric have increased rapidly. Exposure to geohazards has increased dramatically in recent decades and continues to do so. In particular, growing urban environments - including megacities - are in harm's way. Because of the increasing complexity of modern society even moderate hazards can cause regional and global disasters.

Natural hazards that occur frequently on our dynamic planet are increasingly causing loss of human life and damage to goods and infrastructures at the local, regional and global scale, depending on their intensity. The Science Position Paper 'Extreme Geohazards: Reducing the Disaster Risk and Increasing Resilience' analyses the potential effects of low-probability high-impact events, which might cause global disasters and even bring our already stressed global society beyond the limits of sustainability.

The paper, a joint initiative by the European Science Foundation (ESF), the Group on Earth Observations (GEO) and the Geohazard Community of Practice (GHCP), following a high-level ESF-COST Conference on the subject, addresses several types of geohazards, but puts special emphasis on the impending risk of catastrophic effects on populations and infrastructures should our growing and increasingly interconnected modern society be exposed to a very large volcanic eruption. The paper highlights the urgency of establishing an effective dialogue with a large community of stakeholders in

order to develop robust risk management, disaster risk reduction, resilience, and sustainability plans in the coming years and decades. It also underlines the need to develop the methodology to assess the potentially global impacts that a major hazard would have on our modern society, which would provide guidance to reduce vulnerability where possible and increase general resilience in the face of surprise events. It concludes that preparedness requires a global monitoring system that could provide sufficiently early warnings, should such a major hazardous event develop.

The report is to be presented at a special session during the European Geosciences Union General Assembly (EGU) in Vienna on Tuesday and Wednesday 14-15th April 2015,. The EGU General Assembly is an event that brings together geoscientists from all over the world which makes it the perfect place to deliver such a publication.

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#### Notes for Editors

##### European Science Foundation (ESF)

The European Science Foundation was established in 1974 to provide a common platform for its Member Organisations - the main research funding and research performing organisations in Europe - to advance European research collaboration and explore new directions for research. ESF provides valuable services to the scientific and academic communities - such as peer review, evaluation, career tracking, conferences, implementation of new research support mechanisms and the hosting of high-level expert boards and committees - with the aim of supporting and driving the future of a globally competitive European Research Area. ESF currently has 66 member organisations in 29 countries. <http://www.esf.org>

##### Group on Earth Observations (GEO)

The Group on Earth Observations (GEO) is an intergovernmental organisation developing and implementing the Global Earth Observation System of Systems (GEOSS). GEO's vision is a future wherein decisions and actions, for the benefit of humankind, are informed by coordinated, comprehensive and sustained Earth observation and information. GEO has currently 97 Member Countries and is supported by 87 Participating Organisations. <http://www.earthobservations.org>

##### Geohazard Community of Practice (GHCP)

The GHCP is a Community of Practice (CoP) supporting the Group on Earth Observations (GEO). The GHCP brings together groups and individuals involved in various aspects of geohazards, including research, monitoring and risk assessments, mitigation, and adaptation. The GHCP aims to provide a link between the broad geohazards community of practice and GEO in order to ensure that the needs of this community are taken into account in the development of GEOSS; to facilitate support and participation of this community in the building of GEOSS; and promote the use of GEOSS for geohazards-related applications. The GHCP also provides a communication and coordinating platform for high level policy makers and the broader geohazards community. <http://www.geohazcop.org>

Authors of the report 'Extreme Geohazards: Reducing the Disaster Risk and Increasing Resilience' are Hans-Peter Plag, Mitigation and Adaptation Research Institute, Old Dominion University, Norfolk, VA, USA; Sean Brocklebank, School of Economics, University of Edinburgh, UK; Deborah Brosnan, One Health Institute, University of

California Davis, Davis, CA, USA; Paola Campus, European Science Foundation, Strasbourg, France; Sierd Cloetingh, Department of Earth Sciences, Utrecht University, The Netherlands; Shelley Jules-Plag, Tiwah UG, Rossbach, Germany; Seth Stein, Department of Earth and Planetary Sciences, Northwestern University, Evanston, IL.

For further information contact:

Deborah Brosnan

[deborahbrosnan@gmail.com](mailto:deborahbrosnan@gmail.com)

or

Paola Campus

[pcampus@esf.org](mailto:pcampus@esf.org)