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## Geoscience, a tool for civil protection against floods

*Intelligere, tueri noscendas - To understand, to identify and to protect*

The European Federation of Geologists (EFG), the professional body that represents 25 national geological association members, is drawing the attention of policy makers at international, European, national, regional and local level to the paramount importance of geoscience in civil protection against natural hazards and especially in floods given the recent events in Germany, Belgium and France this June.

These floods resulted in the loss of life for at least 12 people 600 pupils were trapped in schools with the risk of losing lives. Fortunately, they were eventually brought to safety. Streets were submerged and the Louvre and Orsay museum were closed with several artwork moved to the top floors. The flood cost is currently estimated at €600 million worth of damage with the potential to reach more than a billion euros. Previous floods of June 2013 led to €12 billion in economic losses across nine EU Member states. It is expected that the average annual economic loss due to flooding will be in the range of €23.5 billion by 2050, over five times the amount for the period 2000 to 2012 (€4.6 billion).

The previous figures are indicative of the funds that are and will repeatedly be spent every year for the same reason without bringing the required result of safety. Furthermore, it prevents the release of funds for societal progress. These costs stress the resources of insurers and governments.

Flood disaster conditions are created by changes in land use and reckless building in vulnerable areas such as floodplains with subsequent failure to control flooding. Levee failures are extremely difficult to alleviate with disasters being even worse as usually there are no contingency plans for such cases. Floods damage human settlements, force evacuation, damage crops, strip farmland, wash away irrigation systems, result in erosion of land or make it otherwise unusable. Forced agricultural development has eliminated natural obstacles such as hedges, herbaceous ditches, trees and topographic raisings. A water volume which was taking significant time to reach a river or a stream is now arriving within a few hours period.

Current policy concentrates on reaction to disasters, rather than taking preventive and mitigation measures. With climate change and the continuous increase of construction activities in hazard-prone areas, concentration on disaster reaction will only lead to continuous increase in cost. Therefore the EFG recommends to:

- 1) Integrate geology into future European Directives and national legislation.
- 2) Educate society to improve the understanding of and response to natural hazards.
- 3) Develop and install early warning systems (geo-indicators) in areas at risk.
- 4) Open access to the scientific data. European coordination project.

The group of experts on Natural Hazards of the European Federation of Geologists is available to provide all necessary information and to make recommendations from a geological perspective, so that it will lead to a significant reduction of negative effects caused by natural disasters. For further analysis on the recent flood events, interested readers are invited to study the position paper produced by EFG and its Panel of Experts on Natural Hazards and Climate Change (<http://eurogeologists.eu/european-network>).

**About EFG:** The European Federation of Geologists is a non-governmental organisation that was established in 1980 and includes today 25 national association members. EFG is a professional organisation whose main aims are to contribute to a safer and more sustainable use of the natural environment, to protect and inform the public and to promote a more responsible exploitation of natural resources. EFG's members are National Associations whose principal objectives are based in similar aims. The guidelines to achieve these aims are the promotion of excellence in the application of geology and the creation of public awareness of the importance of geoscience for the society.



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**About the EFG Panel of Experts on Natural Hazards:** The group has been established in March 2003, in relation to EC initiatives on Civil Protection, DG Environment, and has since then provided many contributions to the EC.

Pavlos Tyrologou is the coordinator of this Panel of Experts is Chartered Geologist and holder of EurGeol title in the field of Engineering and Environmental Geology and also acts as focal point for the EFG. in the working group for the European flood directive.

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