



## **A prototype of an interactive web-based risk analysis tool for floods and landslides**

Zar Chi Aye, Michel Jaboyedoff, and Marc-Henri Derron

Institute of Earth Sciences (ISTE), University of Lausanne, Lausanne, Switzerland (zarchi.aye@unil.ch)

Within the framework of the European project CHANGES, we developed a prototype web-GIS based risk analysis tool for natural hazards, in particular for floods and landslides, based on open-source geospatial software and technologies. This tool is developed based on Boundless (Opengeo) framework and its client side SDK environment with customized plugins for the risk analysis and data management modules of the web based decision support platform. Free and open source components were applied: PostGIS spatial database, GeoServer and GeoWebCache for application servers with tile cache and GeoExt and OpenLayers for user interface development of the platform. The aim of the presented tool is to assist the experts (risk managers) in analyzing the impacts and consequences of a certain hazard event in the considered region as well as to support the responsible authorities and decision makers in making decisions for selection of risk management strategies to be implemented in the region. Within the platform, the users can provide (upload) the necessary maps and data such as hazard maps, elements at risk maps and vulnerability information. For the vulnerability component of the platform, the users can not only upload the vulnerability tables of a certain elements at risk for a given range of hazard intensity values but also create own vulnerability curves by giving the parameter values of a built-in vulnerability function of the platform. Based on these provided input information, the losses (amount of damages and number of people killed) of a certain hazard scenario are calculated on-the-fly and visualized interactively in the web-GIS interface of the platform. The annualized risk per year can also be obtained based on the combination of these calculated loss scenarios with different return periods of a hazard event. The application of the tool at a regional scale is demonstrated using one of the case study sites, Fella River of North Eastern Italy, of the CHANGES project.