LTVH: A new QGis tool to perform long-term volcanic hazard assessment

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Abstract.

Long-term volcanic hazard (LTVH) assessment is an important step for risk-based decision making in land use and emergency planning. The probabilistic approach has been applied to assess long-term volcanic hazard in the form of event tree structure containing possible eruptive scenarios. The total probability of having a particular event is performed combining all the probability density functions for each branch in each node of the event tree structure. One of the most important goals is to allow a free, multi-platform, and user-friendly applicability of this methods for decision makers. In this paper, we present a new plugin for a Quantum Gis (QGis) software, based on a Bayesian event tree structure. QGis is an open source Geographic Information System (GIS), with the possibility to add new packages. This new tool allows to perform the probability of any particular area being affected by a desctructive volcanic event within a given period of time. Graphical user interface (GUI) is designed to help user in the Bayesian event tree analysis and to visualize re- sults in a numeric, and graphic view. However, it permits to update the probabilities changing input parameters, if new data are available. This user-friendly interface is divided in different steps that are very helpful and useful for decision makers: (1) Evaluate the probability for each branch in each node in the event tree structure and visualize results in a pie-chart; (2) evaluate the total probability for different eruptive scenarios and compare the results in a bar chart. The LTVH plugin represents the first step toward a free, multi-platform, and user-friendly tool in a QGis to assess spatio-temporal volcanic hazard, and different eruptive scenarios simulations.

Keywords. Bayesian event tree - QGis plugin Long-term volcanic hazard Free software Eruption 20 forecasting