Lava flow hazard map of Karthala volcano produced with Q-LavHA plugin

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Q-LavHA (Quantum Lava Hazard Assessment) is a new open access plugin which simulates lava flow propagation on a Digital Elevation Model (DEM). It combines existing probabilistic and 1D thermos-rheological deterministic (FLOWGO; Harris and Rowland, 2001) models to define probable areas which may be inundated by lava flows. The simulations are produced from one or multiple regularly distributed eruptive vents. This option not only enables lava flow simulations from a well-defined vent (point) but also from an eruptive fissure (line) or clusters of closely spaced vents (surface). Using susceptibility maps giving the probability of occurrence of different vent locations, a lava flow hazard map can be generated. In this contribution, we present a lava flow hazard map produced for the specific case study of the volcanic Ngazidja Island (Comoros). A spatial eruption probability map is first derived based on the location of vents and fissures mapped on the geological map and interpreted from the Digital Elevation Model. This map has been obtained using the QVAST tool (Bartolini et al., 2013). A sensitivity analysis of a range of Q-LavHA parameters on the resulting map is conducted. Additionally, we investigate the possible impact of areas with high probability of lava flow inundation on the exposed infrastructures of the island. Our case study demonstrates how Q-LavHA can be used by scientists and stakeholders to improve their understanding of the spatial distribution of lava flow hazard, influence their land use decisions and support evacuation planning. REFERENCES: Harris and Rowland (2001), FLOWGO: a kinematic thermo-rheological model for lava flowing in a channel, Bull. Volcanol., 63, 20-44. Bartolini et al. (2013), QVAST: a new Quantum GIS plugin for estimating volcanic sus- ceptibility, Nat. Hazards Earth Syst. Sci., 13, 3031–3042.