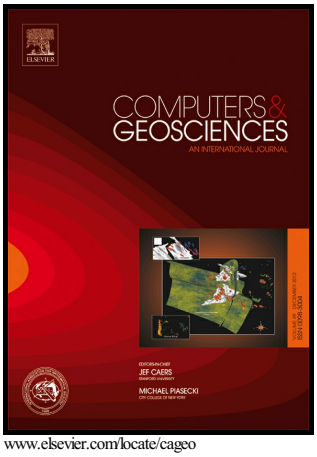

www.elsevier.com/locate/cageo

Q-LAVHA: A FLEXIBLE GIS PLUGIN TO SIMULATE LAVA FLOWS

Mossoux Sophie, Saey Mathijs, Bartolini Stefania, Poppe Sam, Canters Frank, Kervyn Matthieu

PII: S0098-3004(16)30371-5
DOI: http://dx.doi.org/10.1016/j.cageo.2016.09.003
Reference: CAGEO3834

To appear in: *Computers and Geosciences*

Received date: 11 March 2016
Revised date: 13 July 2016
Accepted date: 7 September 2016

Cite this article as: Mossoux Sophie, Saey Mathijs, Bartolini Stefania, Popp Sam, Canters Frank and Kervyn Matthieu, Q-LAVHA: A FLEXIBLE GIS PLUGIN TO SIMULATE LAVA FLOWS, *Computers and Geosciences* http://dx.doi.org/10.1016/j.cageo.2016.09.003

Q-LAVHA: A FLEXIBLE GIS PLUGIN TO SIMULATE LAVA FLOWS

Mossoux Sophie[1,2*], Saey Mathijs[3], Bartolini Stefania[4], Poppe Sam[1], Canters Frank[2], Kervyn Matthieu[1]

[1]Physical Geography, Department of Geography, Earth System Science, Vrije Universiteit Brussel, Pleinlaan 2, 1050 Brussels, Belgium

[2]Cartography and GIS Research Group, Department of Geography, Vrije Universiteit Brussel, Pleinlaan 2, 1050 Brussels, Belgium

[3]Software Languages Lab, Department of Computer Science, Vrije Universiteit Brussel, Pleinlaan 2, 1050 Brussels, Belgium

[4]Group of Volcanology, SIMGEO (UB-CSIC), Institute of Earth Sciences Jaume Almera, ICTJA-CSIC, Lluís Solé i Sabarís s/n, 08028 Barcelona, Spain

smossoux@vub.ac.be

mathsaey@vub.ac.be

sbartolini.1984@gmail.com

spoppe@vub.ac.be

fcanters@vub.ac.be

makervyn@vub.ac.be

[*]Corresponding author: **Mossoux Sophie. Tel.: +32 2 629 33 84.**

Abstract

Q-LavHA is a freeware plugin which simulates lava flow inundation probability from one or regularly distributed eruptive vents on a Digital Elevation Model (DEM). It combines existing probabilistic and deterministic models and proposes some improvements to calculate the probability of lava flow spatial propagation and terminal length. Spatial propagation is constrained by the probabilistic steepest slope. Corrective factors are included to allow the flow simulation to overcome small topographical obstacles and to fill pits. The terminal length of the flow simulation can be determined based on a fixed length value, a statistical length probability function or based on the thermo-rheological properties of an open-channel