



Preliminary hazard map of the Southern Rift; Mount Etna (Italy)

G. Norini (1), B. Aldighieri (2), E. Bertino (3), F. Comoglio (4), M.L. Damiani (3), G. Gropelli (2)

(1)Istituto Nazionale di Geofisica e Vulcanologia, Sez. Catania, Piazza Roma 2, 95123 Catania, Italy (norini@ct.ingv.it), (2)Istituto per la Dinamica dei Processi Ambientali, sezione di Milano, CNR, via Mangiagalli 34, 20133 Milano, Italy, (3)Dipartimento di Informatica e Comunicazione, Università degli Studi di Milano, via Comelico 39/41, 20135 Milano, Italy, (4)Dipartimento di Scienze della Terra - A. Desio, Università degli Studi di Milano, via Mangiagalli 34, 20133 Milano, Italy.

We present an integrated approach and a multidisciplinary methodology to compile volcanic hazard map for lava flow invasion. In addition we display an application of the proposed methodology to a sector of Mount Etna, the Southern Rift, one of the more active areas of the Volcano (Behncke & Neri, 2003). The basis and the starting point are a detailed geological survey and a high-resolution stratigraphy (at 1:10,000 scale) that allow us to recognise and to map about 30 lava flows along the Southern Rift. The geological data (lava flow eruptive fracture location, relative or historical age, length and outcropping area) are organised in a geographic database. In addition GIS software analyses (Gropelli & Norini, 2005), statistical tests and probabilistic lava flow model (Damiani et al., 2006) are applied. Our methodology rests on five steps. 1) Detailed geological survey and historical descriptions (Branca & Del Carlo, 2004) to produce a geological map identifying recent lava flows and their distribution. 2) GIS elaborations of geological data (e.g. lava flow length, eruptive fissure age, qualitative and quantitative spatial map of probability that allows to recognise the areas where eruption probability is more relevant based on eruptive fractures density, etc.). 3) Realisation and testing of a lava flow simulation model (ELFM) based on a high resolution DEM to obtain the morphological constraint of the lava flow simulation. 4) Preliminary lava flow hazard map computation based on the ELFM combined with the eruption probability of each pixel of the DEM. 5) Hazard map validation based on the geological map and its elaborations. We applied the previous described steps to

the Southern Rift, from 2002-03 eruptive fissure to Monte S. Leo (1100 m a.s.l.) and we obtained the related hazard map for lava flow invasion, which can be used for land and urban planning.