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Near-real-time forecasting of lava flow hazards using the MAGFLOW cellular automata model during the 2006 Etna eruptions

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The lava flow hazard on Etna volcano was evaluated during the ongoing eruptions by means of the MAGFLOW cellular automata model. This model was developed for simulating lava flow paths and the temporal evolution of lava emplacement. MAGFLOW is intended for use in emergency response situations during an eruption to quickly forecast the lava flow path over some time interval from the immediate future to a long-time forecast. Many data are necessary to run MAGFLOW and to determine how far lava will flow. However, for a given composition, the volumetric flux of lava from the vent (i.e. the lava effusion rate) is the principal factor controlling final flow dimensions. As such, simulations that take into account the way in which effusion rate changes during an eruption, and how this influences the spread of lava as a function of time, are of special interest, particularly as effusion rates can be highly variable. To this end, during the latest eruptions of Etna, occurring in July and October 2006, the lava effusion rates were estimated at regular intervals (i.e. up to two times per day) using thermal infrared satellite data (e.g. MODIS, AVHRR). The 2006 Etna eruptions represented a further step towards defining the true potential of the MAGFLOW model as an effective tool for real-time forecasting of lava flow hazards. We will briefly summarize results obtained by comparing the simulated and the real events.