



2006 summit eruptions of Mount Etna (Italy): rock and lava avalanches resulting from interaction of basaltic magma with external water

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16 months after the end of its latest (2004-2005) flank eruption, Etna entered into a new period of summit activity in mid-July 2006, which continued intermittently for five months. All activity was concentrated at and near to the Southeast Crater (SEC), the youngest of Etna's four summit craters, involving a number of vents in different locations at different times. The 2006 activity can be distinguished into two main phases. The first lasted from 14 to 24 July, when Strombolian and effusive activity occurred from a short fissure on the lower ESE flank of the SEC cone. This phase culminated with a burst of lava fountaining on 20 July. The second phase lasted from 31 August until 14 December and consisted of 20 eruptive episodes at or near the summit of the SEC cone, accompanied, from 12 October onward, by periodic effusive activity from a number of vents located in various sites to the E-SE and W-SW of the cone. The most persistent effusive vents formed on 12 October at 2800 m a.s.l. on the upper W wall of the Valle del Bove, about 0.9 km SE of the SEC, and on 26 October at 3050 m at the S base of the central summit cone, about 0.45 km from the SEC. While the former remained continuously active through early December, the latter tended to erupt mainly during paroxysmal episodes at the SEC and did not erupt after 24 November. Other effusive vents were intermittently active on the W, E, S and SE flanks of the SEC cone. After a final vigorous burst of activity from vents at the E side of the SEC and the fissure at 2800 m elevation, the activity stopped abruptly on 14 December. Maximum lava flow lengths during the 2006 eruptions were 3.9 km (July eruptive phase), 4.8 km (2800 m vent), and 3.5 km (3050 m vent). The total volume of lava emitted during the 2006 activity is approximately 15-20 x 10⁶ m³. The activity at the SEC itself was often accompanied by dramatic mass wasting processes such

as collapse of parts of the cone, highly unusual flowage processes involving both old rocks and fresh magmatic material, and interaction of magma with external water. The most spectacular events of this type occurred on 16 November, when numerous rockfalls and avalanches were generated during the opening of a large fracture on the SE flank of the SEC cone. The largest avalanches were clearly generated explosively - possibly by interaction of intruding magma with water-soaked rocks constituting the cone's flanks - and traveled up to 1 km from their source, representing a previously unrecognized hazard to visitors of the summit area.