9th Alexander von Humboldt International Conference
Istanbul | Turkey | 24 – 28 March 2014
AvH9-32

Estimating the eruptive potential of Ischia volcanic island (Southern Italy)

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Since about 55 ka the active volcanic island of Ischia has undergone progressive uplift of about 800m, producing fracturing of the shallow crust (2 km thick), earthquakes and volcanic activity. The main active area that is involved in the resurgence is the structure of Mount Epomeo, which is located in the central sector of Ischia Island, with an area of roughly 4×4 km^2. The resurgence is produced by volume increase of a shallow magma body, with melt zone probably occurring at 4km of depth and the top of mush zone at 2km. The very large heat flow and high geothermal gradient of the island, the historical volcanic and seismic activity (last eruption occurred in 1302, while destructive earthquakes occurred in 1881 and 1883) and 62,000 people live on Ischia Island, with many more visiting in the summer, make this island a high volcanic risk zone. The eruptive potential of the island is here investigated using the laccolith model proposed in previous studies. The model shows that an increase of laccolith volume, from 21km^3 to present 80 km^3, occurred in the last 33ka, and that the possible magma output, in case of resurgence renewal, can be roughly equal to 10% of the magma influx required for the volume increase of the laccolith.