

First recorded eruption of Nabro volcano, Eritrea, 2011

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The 2011 eruption of Nabro began with few detected precursory signals. At the time there was no seismic network operating in Eritrea. Nevertheless a rapid response on the ground led to timely evacuation of settlements within the two calderas and on the flanks of the volcano. Several thousand people were displaced and cared for in temporary camps in the region. In broad terms, Nabro is sited in the extensional zone of Afar, close to the Mesozoic crustal block of the Danakil Alps. It reaches a maximum elevation of over 2200 m above sea level, and has an 8 km wide summit caldera and associated ignimbrites. The 2011 eruption began on 12 June following intense seismicity. It is the first eruption of Nabro on record, highlighting the potential of caldera systems to erupt with limited warning. It is also the first seismicity of note instrumentally recorded in this part of the rift. Remarkably, the Nabro plume significantly perturbed stratospheric aerosol optical depth reflecting a sizeable SO₂ emission (of order 1.5 Tg). We present here a preliminary synthesis of the nature and causes of the eruption based on multiple observations (satellite remote sensing, seismology, infrasound records, ground observations, and petrological characterisations).