

Detailed evaluation of PDC's volume for large eruptions: the case of the 39.8 ka Campanian Ignimbrite, Italy

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Introduction

This supporting information explains how the errors and uncertainties related to the ignimbrite volume were calculated. These were estimated as 1.6 km³ in proximal area and 3.9 km³ in distal area.

Data related to the location of outcrops and density are reported in the Repository Data online at <https://mfr.osf.io/render?url=https%3A%2F%2Fosf.io%2F3a6bz%2Fdownload>.

S1 - The volume uncertainties.

The uncertainties were determined by two different methods, one for the proximal area and one for the distal. In the first case, the proximal isopach map was traced fitting thickness data. In order to avoid subjective interpretation, a second isopach map was delineated tracing isopachs differently, but always consistent with data. A new volume was calculated from this second convincing proximal isopach map. The percentage

difference with the first map was estimated (3.06%) corresponding to a volume of 1.6 km³.

The main error in estimating the paleo-valley topography is the extrapolation of the base elevation of the valley itself. For this reason, in the area of Altavilla Irpina, the profiles were modified, and the base elevations were adjusted to reach the maximum difference possible in altitude, always constrained by field data. The volume diverged by 25%, corresponding to a volume of 3.9 km³. The total CI volume uncertainties are 5.5 km³.