

Italian super-eruption larger than thought

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Recent research suggested that the super-eruption of the Campi Flegrei caldera volcano in southern Italy about 40,000 years ago may have played a part in wiping out, or forcing the migration of, the Neanderthal and modern human populations in the eastern Mediterranean regions that were covered in ash.

Now a new modeling study by Costa et al. suggests that this eruption may have been even larger than previously thought. This Campi Flegrei eruption produced a widespread ash layer known as Campanian Ignimbrite (CI). Using ash thickness measurements collected at 115 sites and a three-dimensional ash dispersal model, the authors find that the CI super-eruption would have spread 250-300 cubic kilometers (60-72 cubic miles) of ash across a 3.7-million-square-kilometer (1.4- million-square-mile) region-2 to 3 times previous ash volume estimates.

The updated values stem from a new method of modeling what the wind would have been like during the eruption. Traditionally, models assume a consistent wind field for the entire duration of an eruption. The authors, however, incorporate wind fields into the model that are based on 15 years of recent measurements, using the modern wind field that best accounts for the ash deposit measurements.

On the basis of their updated estimates, the authors calculate that up to 450 million kilograms (990 million pounds) of sulfur dioxide would have been spread into the atmosphere, driving down temperatures by 1-2 degrees Celsius (1.8-3.6 degrees Fahrenheit) for 2 to 3 years. Further, [sulfur dioxide](#) and chloride emissions would have triggered acidic rains,

and fluorine-laden ash would have become incorporated into [plant matter](#), potentially inducing fluorosis, replete with eye, tooth, and [organ damage](#), in [animal populations](#).

More information: Quantifying volcanic ash dispersal and impact of the Campanian Ignimbrite super-eruption, *Geophysical Research Letters*, [doi:10.1029/2012GL051605](https://doi.org/10.1029/2012GL051605), 2012.

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