

Evidence of large volcanic activity in the Caribbean uncovered

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Scientists from the University of Southampton have uncovered evidence of a previously unknown large volcanic eruption in the Caribbean Sea.

By studying ash layers, known as tephra, in marine sediments they identified an eruption that took place on Guadeloupe 2.4 million years ago.

The research, published in the journal *Geology*, indicates this eruption is the largest documented volcanic event in the region since that time.

Lead author, Professor Martin Palmer, at the University of Southampton, said: "Volcanic [eruptions](#) are relatively common in this area of world, but while they are very disruptive for the local community, as seen on Montserrat over the past 20 years, they do not generally have a major impact on neighboring islands. While a large eruption of the scale that we have identified would represent an important hazard to human populations in the wider region if it occurred today, it is very important to note that our research suggests that such events are rare in the Lesser Antilles - there is no indication that another large eruption is imminent."

The research team analysed a sediment core recovered by the Integrated Ocean Drilling Program (IODP) Expedition at a site 30km southwest of Montserrat and 75km west of Guadeloupe in the northeastern Caribbean Sea. This is close to several volcanically active islands in the Lesser Antilles. The core contained an unusually thick (18 cm) tephra that was

deposited 2.4 million years ago.

By analysing the isotopes, trace elements and grain morphology of the tephra, together with volcanological models, the researchers were able to identify the origin and magnitude of the large VEI (Volcanic Explosivity Index) 6 eruption. In comparison, the largest Montserrat eruptions since 1995 had a VEI of 3-4.

Professor Palmer added: "Reconstructing the magnitude of past [volcanic eruptions](#) is important to inform predictions about future eruptions and hazards. This is difficult to accomplish from records on land - old eruptions are often eroded away, buried beneath later eruptions, or obscured by vegetation and soil. Most volcanoes are close to the oceans, so much of the erupted material falls into seawater and accumulates on the seafloor.

"It is important to continue these types of study as they allow scientists to build a more complete picture of conditions required to generate unusually large eruptions in settings where they are normally much smaller."

More information: Martin R. Palmer et al. Discovery of a large 2.4 Ma Plinian eruption of Basse-Terre, Guadeloupe, from the marine sediment record, *Geology* (2015). [DOI: 10.1130/G37193.1](https://doi.org/10.1130/G37193.1)

Provided by University of Southampton

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