



## **Truth, alternative facts or fairy-tales: Reconstructing eruptive dynamics of young submarine eruptions**

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A submarine basaltic eruption occurred west of Terceira Island, Azores (Portugal) between December 1998 and April 2001. This eruption is well-known as it is the last confirmed eruption in the Azores and its detailed description of the peculiar eruption products. During intermittent periods, juvenile products (ellipsoidal basaltic bodies up to 3 m long and 1 m in diameter) were floating at the sea surface. These “lava balloons” commonly consisted of a single gas-filled cavity surrounded by a shell of vesicular basaltic lava and glass only a few centimetres thick.

In July 2016, the German research vessel R/V Meteor (cruise M128) performed a comprehensive bathymetric survey and sampling program in the Azores archipelago. During three dives, the supposed eruptive site of the 1998-2001 eruption was investigated using the Remotely Operated Vehicle ROV Quest 4000 of the Zentrum für Marine Umweltwissenschaften (Marum) at the University of Bremen. Approx. 20 hours of high-definition videos and images were recorded.

The deposits are still pristine without exposed vertical sections due to tectonic or erosional forces. Accordingly, all analysis relates to the last deposited units. The deposits are exclusively volcanoclastic in nature, characterised by two distinct facies types that intercalate in places: 1) laterally extensive layers of volcanic ash and fine lapilli and 2) locally confined zones of clast-supported large volumes porous pyroclasts, many of which show signs of fluidal deformation and a hollow interior. Based on clast size and frequency, proximal and distal depositional areas have been determined, pointing to the contemporaneous activity of several eruptive vents. We conclude that the eruption took place along a N 110° trending fissure of an entity of approx. 2.8 km length in water depths between 200 and 400 m. This fissure sits on the southern wall of an older and significantly larger chain of craters with a total length of 4.3 km.