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Frequent underwater volcanism in the central Aegean Sea

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The extinction of the Minoan culture in the mid second millennium BCE is a well known consequence of the Plinian eruption of Thera volcano (Santorini Island). Santorini is a member of the South Aegean arc forming a chain from the Gulf of Saronikos (Susaki, Egina, Poros, Methana) at West, to an area close to the Anatolian coast at East (Kos, Nisyros and minor islands), through the central part (Milos and Santorini island groups). Underwater volcanic activity was manifested historically only once. During 1649-1650 CE the Kolumbo underwater volcano evolved about 8 km northeast of Santorini. As a consequence of this eruption volcanic ash covered the entire Aegean area and a hazardous tsunami was triggered.
Here we show by means of reflection seismic and magnetic data that underwater volcanism occurred more frequently in the central Aegean Sea than previously assumed. Seismic data show that Kolumbo constitutes of five vertically stacked cones of pyroclastic sediment plus at least four smaller cones on the flank of the volcano. The formation of Kolumbo started synchronous with Santorini Island. The entire volume of the Kolumbo pyroclastic cones is estimated to more than 15 cubic-kilometers. Several small-scale cones have been detected in the Anyhdros Basin some km north-east of Kolumbo, being previously interpreted as mud volcanoes by other authors. However, the similarity of seismic and magnetic signatures of these cones and Kolumbo strongly suggest that these cones were also created by underwater volcanism. Volcanic cones, Kolumbo and Santorini are situated along a NE-SW striking graben system that evolved during five extensional tectonic pulses in the Pliocene.