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Submarine Volcanic Cones in the São Miguel Region/Azores

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São Miguel, the main island of the Azores Archipelago, is located in an area ∼1500 km west of Portugal where the American, African and Eurasian plates converge. Just as well as the other eight Azorian islands, it is of volcanic origin and therefore volcanic processes also play an important role for the evolution of its submarine domain.
Around 300 submarine volcanic cones have been mapped in the vicinity of São Miguel Island with multi-beam data during RV Meteor cruise M79/2 . They are distributed in depth down to 3000 m. They exhibit an average diameter of 600 m, an average slope of 22° and heights mainly between 50 and 200 m, slightly decreasing with increasing water depth. Even if their morphological appearances show no segregation, the volcanic setting can be classified in three different categories. A numerous amount of cones are located on the submarine flank of Sete Cidades Volcano in the west of São Miguel considered as parasitic structures, whereas in the very east they build up an own superstructure possibly reflecting an early submarine stadium of a posterior subaerial stratovolcano like Sete Cidades. The third class is controlled by and orientated along faults, most of them in a graben system southwest of the Island. High-resolution multichannel seismic data depicts that the graben cones extinguished synchronously in the past most likely accompanying with the end of graben formation. Backscatter data reveal a rough surface possibly caused by currents removing the fine grain-size fraction over time. However, a young cone investigated in detail is characterized by a smooth surface, a distal increasing stratification and concave shaped flanks. Other few exhibit craters, all together indicating rather a phreatomagmatic than an effusive evolution of these structures. Very similar in size and shape to cinder cones on-shore São Miguel Island, they appear to be their submarine equivalent.