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A 1 million year eruption history of Ascension Island: insights from stratigraphy and $40\text{Ar}/39\text{Ar}$ dating

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Ascension is an ocean island volcano located in the South Atlantic, ~ 90 km west of the Mid-Atlantic Ridge axis. The volcanic rocks of Ascension define a transitional to mildly alkaline basalt-hawaiite-mugearite-benmoreite-trachyte-rhyolite sequence that spans a wide range of eruptive styles across only ~ 98 km² of land. The central and eastern sectors of the island are predominantly composed of pyroclastic deposits, trachyte and rhyolite lava flows and domes. The northern, southern and western regions comprise mafic lava flows punctuated by scoria cones [1]. The oldest rocks exposed at the surface outcrop in the centre of the island and have been dated at ~ 1 Ma [2]. Here we present a new pyroclastic stratigraphy and $40\text{Ar}/39\text{Ar}$ ages for Ascension, revealing that more than 75 explosive eruptions have occurred during the last 1 Ma. Throughout this period, sub-Plinian and phreatomagmatic eruptions have been common, with at least 12 eruptions producing pyroclastic density currents (PDCs). In addition, felsic lava flows and domes, as well as basaltic lava flows have been dated to shed light on timescales of effusive volcanism on Ascension. These data form part of a larger project, which aims to integrate the timing and style of volcanic activity on Ascension with the timescales over which magmatic processes occur. The project is allowing us to examine the control that magmatic processes exert over eruption duration, style and magnitude. References: [1] Atkins et al. (1964) *Nature* 204, 722-724; [2] Jicha et al. (2013) *J. Petrol.* 54, 2581-2596