

Temporal succession, intensities, and magmatic evolution of large-magnitude Plinian eruptions from Fogo and Brava, Cape Verde Islands

Steffen Eisele, Armin Freundt, Steffen Kutterolf, Stefan Reissig, Dirk Nuernberg

GEOMAR Helmholtz Centre for Ocean Research Kiel

E-mail: seisele@geomar.de

Eleven sediment gravity cores of up to 6 m length have been collected from the ocean floor around the southern chain of the Cape Verde Archipelago. These cores contain ash layers that we were able to correlate between cores using glass and mineral, major and trace element compositions. These correlated ash layers represent five basanitic/tephritic eruptions from the island of Fogo and four phonolitic eruptions from the adjacent island of Brava. Correlations with these islands are supported by on-land fieldwork and analyzed samples. Our tracing of these layers along the seafloor up to 240 km distance from the islands proves that all nine eruptions were high-intensity, large-magnitude Plinian events.

The alternation of basanitic/tephritic and phonolitic layers shows that highly explosive volcanism on both islands overlapped completely in time. Detailed Mg/Ca and $\delta^{18}\text{O}$ studies of planktonic and benthic foraminifera combined with radiocarbon ages from one core (M80/3-43) suggest that huge explosive eruptions from either Fogo or Brava took place about every 24 ka during the last 160 ka. Our ongoing geochemical, petrological and stratigraphic studies aim to reveal the conditions of magma storage and evolution as well as triggering of eruptions for both the Fogo and Brava systems, and may elucidate possible links between these simultaneously active magma systems.