Geophysical Research Abstracts
Vol. 18, EGU2016-14883-2, 2016
EGU General Assembly 2016

Constraining the onset of flood volcanism in Isle of Skye Lava Field, British Paleogene Volcanic Province

Syahreza Angkasa (1), Dougal.A. Jerram (1), Henrik Svensen (1), John M. Millet (2,3), Ross Taylor (3), Sverre Planke (1,2)

(1) Centre for Earth Evolution and Dynamics (CEED), University of Oslo, Norway, (2) VBPR AS, Oslo Science Park, Gaustadalléen 21, N-0349 OSLO, Norway, (3) Department of Geology & Petroleum Geology, University of Aberdeen, UK

In order to constrain eruption styles at the onset of flood volcanism, field observations were undertaken on basal sections of the Isle of Skye Lava Field, British Paleogene Volcanic Province. This study investigates three specific sections; Camus Ban, Neist Point and Soay Sound which sample a large area about 1500 km2 and can be used to help explain the variability in palaeo-environments at the onset of flood volcanism.
Petrological analysis is coupled with petrophysical lab data and photogrammetry data to create detailed facies models for the different styles of initiating flood basalt volcanism. Photogrammetry is used to create Ortho–rectified 3D models which, along with photomontage images, allow detailed geological observations to be mapped spatially. Petrographic analyses are combined with petrophysical lab data to identify key textural variation, mineral compositions and physical properties of the volcanic rocks emplaced during the initial eruptions.
Volcanism initiated with effusive eruptions in either subaerial or subaqueous environments resulting in tuff/hyaloclastite materials or lava flow facies lying directly on the older Mesozoic strata. Volcanic facies indicative of lava–water interactions vary significantly in thickness between different sections suggesting a strong accommodation space control on the style of volcanism. Camus Ban shows hyaloclastite deposits with a thickness of 25m, whereas the Soay Sound area has tuffaceous sediments of under 0.1m in thickness. Subaerial lavas overly these variable deposits in all studied areas. The flood basalt eruptions took place in mixed wet and dry environments with some significant locally developed water bodies (e.g. Camus Ban). More explosive eruptions were promoted in some cases by interaction of lavas with these water bodies and possibly by local interaction with water – saturated sediments. We record key examples of how palaeotopography imparts a primary control on the style of volcanism during the initiation of flood basalt provinces.