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Off rift and on rift volcanism along the southern most extremity of the Reykjanes Ridge.

Armann Hoskuldsson (1), Fernando Martinez (2), and Richard Hey (2)

(1) University of Iceland, Institute of Earth Sciences, Reykjavík, Iceland (armh@hi.is), (2) University of Hawaii, HIGP/SOEST, Honolulu, HI, United States

In August-September 2013 R/V Marcus G Langseth conducted a geophysical survey of the southern Reykjanes Ridge and flanks to the Bight transform fault including the first orthogonally spreading segment to the south. The objectives were to better understand how the Reykjanes Ridge replaced the earlier transform fault-dominated structure. The survey acquired full-coverage multibeam bathymetry of some 90,000 km2 and acoustic backscatter imagery and coincident gravity and magnetic profiles. The Rift axis of the RR is defined by a rift valley, striking 36° NE, and deepens from N to S towards the Bight transform fault. Volcanism along the rift axis is characterized by en-echelon volcanic ridges striking 14°NE and rising some 400-1000 m above the valley floor, single circular volcanic sea mounts 400-600 m high, lava flow sheets and craters. Fissures and faults are not very prominent with in the rift valley. However, at both sides bounding the rift valley, fissure, faults and uplifting of the crust is a dominant feature. Surprisingly numerous volcanic edifices are observed on the faulted crust drifting away from the plate boundary. Further these volcanic edifices do not all show any faulting and have cone shape forms, indicating more explosive activity than within the rift. The volcanic edifices range in size from 2-3 km at the base to some hundreds of meters. Backscatter analysis shows that in general the volcanic edifices have higher values than the surrounding basement. These vents are observed as far as 100 km from the rifting center. High backscatter along with little or no faulting indicates that these off rift volcanic vents are younger than the basement they are resting on, thus manifesting that volcanism is not solely confined to the active rift boundary in the area. The segment south of Bight transform fault is highly dotted by these off rift volcanic vents