

From the Icelandic continental shelf to the deep abyss; a tale of divergent plate boundary.

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Iceland is a part of the north Atlantic igneous providence and as such forms a large island in the middle of the north Atlantic. With its continental shelf, Iceland covers about 780 kkm². The mid Atlantic ridge plate boundary crosses through Iceland from south to north. In this presentation, we are presenting results from two missions that cover the southern and northern part of the ridge named Reykjanes ridge. We shall show how the Reykjanes ridge plunges into the abyss from Iceland and follow its extent some 900 km to the south, until it hits the Bight Transform fault. This part of the Mid Atlantic ridge system is slow spreading with an average separation of some 2 cm per year. Due to unprecedented detailed multibeam mapping in the area finest details in volcanic structures can be observed. However, the active plate boundary shows remarkable diversity in overall forms and individual landforms as we extend away from Iceland. Close to Iceland evidence of shallow magma storage in the crust are evident, with calderas and evolved magma composition. At the termination of the Reykjanes ridge single volcanic ridges are observed at regular interval. These ridges are formed in multiple eruptions and occupy the rift valley in the south. However, towards the north rift valleys are absent or shallow. In between the rift valleys we observe monogenetic eruptive vents. Reorganization of the plate boundary is observed in magnetic fabric of the seafloor and numerous oceanic core complexes seem to be related to such reorganization. Off rift monogenetic eruptive vents are also more frequent as we go further away from Iceland.