# Predicting the Internal Structure of Faults in Basaltic Rocks and its Effect on Along- and Across- Fault Fluid Flow.

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It is well known that faults have the potential to alter fluid flow pathways within hydrocarbon reservoirs, and as a result, a wealth of research has been carried out on the nature of faults and their effect on fluid flow within sedimentary-hosted reservoirs. Recent increases in hydrocarbon production from volcanic-hosted reservoirs have generated interest in the flow properties of faults within volcanic rocks. To predict the effect of faulted volcanic rocks on fluid flow, the controls on the fault zone internal structure must be understood.

This project focuses on faults cutting basalt sequences exposed in the Faroe Islands, Iceland and Scotland. At each site I have made detailed (1:2 scale) maps of fault rock distribution (i.e. breccias, gouge etc) and sites of previous fluid flow (i.e. mineral veins and areas of alteration) from faults with a range of displacements. Comparing the detailed fault architectures from these sites has allowed me to develop a conceptual model for fault rock generation in volcanic rocks, as a function of displacement and host rock type. Ultimately, understanding the controls on fault architecture will allow us to place constraints on how fluid flow is affected at a given host rock type and displacement value.