

## Compartmentalization of Fluids Around Salt Diapirs, Northern Spain

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Faults exert a significant influence on the movement of fluids in the subsurface of the Earth. Faults may serve as conduits along which fluids migrate, or as barriers to fluid flow. Mesoscale faulting around salt structures often causes compartmentalization of fluids. When this occurs, fluids of different types become segregated by stratigraphic and structural boundaries. This affects how we explore for and exploit mineral deposits and hydrocarbon reservoirs in the vicinity of salt structures. This project aims to determine and rank the stratigraphic and structural variables that control the compartmentalization of fluids in the vicinity of salt diapirs. To achieve this goal this project will document the paleohydrologic system around the Bakio and Bermeo salt diapirs in Basque-Cantabrian basin of northern Spain. These diapirs are well-exposed, have associated mesoscopic faulting, and are especially valuable research targets because they are situated in deepwater turbidite settings that are highly prospective and often physically inaccessible.

This project will use field mapping, mesostructural analysis of faults and fractures, and laboratory analysis of veins and host rocks to test the hypothesis that mesoscopic faulting compartmentalized paleofluids in the vicinity of these salt diapirs. Petrographic work will define the paragenesis of the vein minerals and host rock cements and guide the selection of samples for geochemical analysis. Anticipated analyses include, SEM, CL, and stable isotope and fluid inclusion microthermometry, which will constrain the sources, temperatures and compositions of paleofluids around the diapirs. Compartmentalization will be interpreted by mapping the spatial distribution of this geochemical data.