

# **Investigation of transform type plate boundaries within the project FLOWS: Seep fluids and gases in the Guaymas basin**

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Fluids and gases expelled at cold seeps and hot vents allow insights into deep subsurface processes and affect the chemical budget of seawater. Recent findings indicate that transform-type plate boundaries (TTPBs) are active sites of fluid expulsion triggered by tectonic activity. The investigation of TTPBs is the central theme of the multidisciplinary EU-COST funded project FLOWS. FLOWS was initiated due to the recent occurrence of large earthquakes and the discovery of related seepage of deep sourced fluids in old oceanic TTPBs. The Guaymas Basin (Gulf of California, Eastern Pacific) may serve as a young oceanic counterpart in which young oceanic crust, intersected by short spreading segments and strike-slip faults is buried under organic-rich sediments. Pore fluids from vents and seeps in the Guaymas Basin will be studied on a research cruise with RV SONNE in June 2015 in order to quantify fluid sources and diagenetic processes. Particular attention is given to quantification and sourcing of methane-rich fluid seeps, triggered by igneous intrusions into organic-rich marine sediments. Fluid emission from such sites might significantly contribute to the global methane budget. Our specific research focus will be on isotope tracers (e.g.,  $\delta^{11}\text{B}$ ,  $\delta^{18}\text{O}$ ,  $\delta\text{D}$ ,  $\delta^{13}\text{C}$ ,  $^{87}\text{Sr}/^{86}\text{Sr}$ , He and other noble gases) and hydrocarbons (e.g.,  $\delta^{13}\text{C}$ ,  $\delta\text{D}$ , C1-C12). First results will be presented and compared to other relevant seep locations.