

The circulation of seawater through hydrothermal systems at mid-ocean ridges has been proposed as a source for calcium (Ca) which is a major chemical constituent of seawater controlling oceans alkalinity and climate change. Although oceans alkalinity and Ca concentrations are supposed to be directly linked to each other it has been shown that deep ocean water contain higher levels of dissolved Ca than expected from calcium carbonate ( $\text{CaCO}_3$ ) dissolution only. The magnitude of the anomalies suggests that fluxes associated with the low-temperature circulation of seawater at mid-ocean ridge systems are much larger than previously thought. In particular, the role of low temperature alteration of basalts has been underestimated in this respect. In order to better understand the processes of chemical alteration and to better constrain the mass balance of Ca in the ocean this project will study the Ca cycle during high and low-temperature alteration at mid ocean ridges.