

SG152 - Atlantic Ocean pH reconstruction before and during the industrial era (Murray Roberts, Heriot Watt)

Abstract

The principal aim of our proposal entitled “Atlantic Ocean pH reconstruction before and during the industrial era” was to use boron isotopes in the cold-water coral (CWC) *Lophelia pertusa* to reconstruct the pH change at the Mingulay Reef Complex from the pre-industrial to the present time. The boron isotopic composition of a number of living samples of *L. pertusa* were measured from several of locations around the world with well constrained pH, including the modern Mingulay Reef. Along with published work, this formed the basis of an improved field calibration for $\delta^{11}\text{B}$ -pH, which was further supplemented by the new analysis of *L. pertusa* collected live from Mingulay and cultured at variable pH. This dataset requires more in depth study but at face value implies that the Mingulay samples up-regulate their internal pH to a lesser degree than *L. pertusa* that lived elsewhere. The cause of this behaviour is currently unknown but may be related to the unusual hydrography of Mingulay. Cultured specimens maintaining this lower degree of up-regulation further implies that it is potentially a unique biophysical adaption of the *L. pertusa* to the conditions found at Mingulay.