

## **Geo Day Presentation Abstract**

Matt Loewen

GeoDay Abstract

### **Trace Metal Budgets in Caribbean Large Igneous Province Melt Inclusions: Searching for a Causal Link to Ocean Anoxic Event 2**

Ocean Anoxic Event 2 (OAE 2) marks the Cenomanian-Turonian boundary at 93.5 Ma. During this time, widespread black shale layers were deposited throughout the world's oceans and these have been associated with low oxygen, ocean acidification, and the extinction of many marine species. Previous work has suggested that the eruption of the Caribbean Large Igneous Province (CLIP) could have been the cause of OAE 2 (Sinton and Duncan, 1997; Kerr, 1998) but only recent Os isotopic evidence has directly linked the timing of these two events (Turgeon and Creaser, 2008). Data from black shale layers associated with OAE 2 have shown evidence for trace metal enrichment (Snow *et al.*, 2005); ocean microbes can utilize these metals to fix nitrogen, sparking an increase in primary production and eventually leading to the formation anoxic deposits as decaying organic matter consumes oxygen (Sinton and Duncan, 1997). My research will test for a direct causal link between these two events by comparing trace metal concentrations in olivine-hosted melt inclusions to whole rock chemistry in Caribbean basalts to determine if a loss of trace metals occurred during eruption or subsequent hydrothermal activity. If nutrient trace metals (e.g., Mo, and Cu, which are also enriched in OAE 2 shale) are found in higher concentrations in melt inclusions than in associated whole rocks, it would indicate that these metals were somehow lost (either in an eruptive plume or hydrothermally) from the original melts.