

# Temporal and Spatial Variations in Galapagos Plume-Ridge Interaction

K. HOERNLE<sup>1</sup>, A. HERBRICH<sup>1</sup>, F. HAUFF<sup>1</sup>,  
R. WERNER<sup>1</sup>, D. GARBE-SCHÖNBERG<sup>2</sup>

<sup>1</sup> IFM-GEOMAR, Wischhofstr. 1-3, 24148 Kiel, Germany (correspondence: khoernle@ifm-geomar.de)

<sup>2</sup> Inst. Geosciences, Christian-Albrechts-Univ., Kiel, Germany

The Cocos-Nazca (Galapagos) Spreading Center and ocean crust to the north and south of the ridge axis were sampled during R/V SONNE cruises 158 and 208 between 86.0-92.5°W. At least three distinct components are needed to explain the variation in the chemistry of the on-axis samples: 1) enriched Wolf-Darwin or Northern Domain (as defined by Hoernle et al., 2000; *Geology* 28) type of component (92.5-91.5°W), 2) enriched Fernandina/Isabella or Central Domain type of component (~91.5-87.5°W) with  $^{206}\text{Pb}/^{204}\text{Pb} > 18.7$ , and 3) depleted component  $^{206}\text{Pb}/^{204}\text{Pb} < 18.7$  at the incipient overlapping spreading center (OSC) at 89.2°W and east of the 87.5°W OSC. Preliminary geochemical data from two of the five profiles orthogonal to the ridge axis, along which the ocean crust north of the ridge was sampled, indicate that changes in the flux of plume material to the ridge varied through time. At the western profile between 91.5-92.0°W, ratios of more to less incompatible elements (e.g. Nb/Zr, Ba/Zr and La/Sm) suggest an overall decrease of the northern plume component with increasing age or distance from the spreading axis. At the eastern profile (between 89.0-89.5°W), where depleted material is at present being sampled at the ridge axis, ratios of more to less incompatible elements suggest an increase in the central plume component in the past. These observations indicate variable flux of different Galapagos plume components to the Cocos-Nazca spreading center over the past ~0.5 Ma. Sr-Nd-Pb isotope data is presently being generated in order to test these preliminary interpretations.