
DI51A-0289: Geochemistry of the Seamounts at the Southeast Chatham Rise, New Zealand

Friday, 15 December 2017

08:00 - 12:20

📍 *New Orleans Ernest N. Morial Convention Center - Poster Hall D-F*

The submarine Chatham Rise, east Zealandia, is a key location of the early continental breakup of the eastern Gondwana (< 100 Ma; [1]). It has been suggested that a mantle plume beneath Zealandia and West Antarctica existed and that a slab window formed as a consequence of the collision of the Hikurangi oceanic plateau with the Chatham Rise, allowing deeper mantle material to upwell and hence cause the rifting. However, the exact processes that have led to this rifting and the sequence of reorganization in the upper mantle in course of and after the breakup of Zealandia from West Antarctica are still unclear. We present new major and trace element and Sr–Nd and high-precision Pb isotope data from submarine samples recovered during the R/V Sonne research expedition SO246 at the southeast Chatham Rise, covering the Chatham Rise Terrace and adjacent areas of the margin and the abyssal plain. The samples include alkali and tholeiitic basalts and minor basanite and trachybasalt, all of which have a composition between ocean island basalt (OIB) and mid-ocean-ridge basalt (MORB). Trace element ratios (e.g., Th/Yb, Nb/Yb) indicate that all but one seamount were derived from enriched sources at a low degree of melting, while one of the seamounts close to the abyssal plain was derived from a depleted mantle source at a high degree of melting. Sr–Nd–Pb isotope variations further support contribution of at least three distinct mantle source components, including a HIMU (high time-integrated U/Pb)-type sources, an enriched mantle (EM)-type sources, and a depleted mantle (N-MORB)-type source. These observations appear to be consistent with previous published data and models proposed by [2] and [3]. These sources will be placed in a chronological framework by incorporating further geochemical data and ^{40}Ar – ^{39}Ar ages, providing us better insights into the sequence of events and magmatic processes that occurred at this region.

References:

- [1] Davy et al. (2008), Hikurangi Plateau: Crustal structure, rifted formation, and Gondwana subduction history, *G³*, 9, Q07004.
- [2] Hoernle et al. (2006), Cenozoic intraplate volcanism on New Zealand: Upwelling induced by lithospheric removal, *EPSL*, 248, 350-367.
- [3] Timm et al. (2010), Temporal and geochemical evolution of the Cenozoic intraplate volcanism of Zealandia, *Earth-Sci. Rev.*, 98, 38-64.

Plain Language Summary

Authors

Ester Munoz Jolis *

GEOMAR Helmholtz Centre for Ocean Research Kiel

Kaj Hoernle

*GEOMAR Helmholtz Centre for Ocean
Research Kiel*

Folkmar Hauff

*GEOMAR Helmholtz Centre for Ocean
Research Kiel*

Dieter Garbe-Schönberg

CAU Kiel

Reinhard Werner

*GEOMAR Helmholtz Centre for Ocean
Research Kiel*

Karsten Gohl

*Alfred Wegener Institute Helmholtz-Center
for Polar and Marine Research
Bremerhaven*

Find Similar

View Related Events

Day: Friday, 15 December 2017