

Bursary report Nina Jordan: the VESPA cruise (May-June 2015)

Thanks to InterRidge I was able to join the VESPA (Volcanic Evolution of South Pacific Arcs) research cruise leaving from Noumea, New Caledonia. This was a cruise about the tectonic and volcanic evolution of the areas between New Caledonia, New Zealand and Australia, i.e. the southwest Pacific. We did seismic, bathymetric and magnetic analyses as well as seafloor sampling of two high areas that had previously been identified from bathymetry: the Norfolk Ridge and the Three Kings Ridge. Previous literature had identified them as subduction-related arcs. However, there are several models of how they could have formed and the models differ as to whether there were reversals in subduction polarity, whether any lavas are of intraplate or arc affinity, what the underlying crust is made up of and when subduction began. We were planning to sample volcanic rocks in particular to establish their age and chemical composition as this can tell us about whether they are subduction-related and if so in which direction the subduction was oriented. During the cruise we executed 43 dredges (dredging is a way of obtaining rocks from the seafloor) and gathered a total of ~7 tons of rock. I was involved in cleaning them, cutting fresh surfaces on the rock saw and making petrographic descriptions for the cruise report. We also had a portable x-ray fluorescence (XRF) machine on board which can detect major and trace elements on a smooth rock surface. This was useful as it gave us a preliminary chemical composition which would otherwise have to wait until the rocks are back in a lab after the cruise. From these preliminary analyses we were able to say that most of the rocks we sampled were indeed from a subduction setting (and not, for example, from an intraplate setting). Further analyses will be made onshore in Brest (France), at GNS in New Zealand and in Noumea (Geological Survey of New Caledonia).

The cruise was an amazing experience and I am forever grateful to InterRidge for the bursary as well as Nick Mortimer and Martin Patriat who are the chief scientists of VESPA.

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PHOTO CAPTIONS:

Photo 1: Nina on the back deck of RV Atalante while waiting for rocks to be brought up from the seafloor.

Photo 2: Interridge bursary winners with cruise chiefs. From right to left: Nick Mortimer, Mederic Amann, Martin Patriat, Nina Jordan