

nBOSS Network: Imaging post-subduction processes beneath North Borneo

AMY GILLIGAN*¹, NICK RAWLINSON², FELIX TONGKUL³, SIMONE PILIA², CONOR BACON²,
OMRY VOLK², DAVID CORNWELL¹, EMILY CROWDER¹, LOUVIS JEFFERY³, BRANDON LEE³,
CHUAN-CHUAN LU¹, TIMOTHY GREENFIELD¹

¹School of Geosciences, University of Aberdeen, Scotland, UK (amy.gilligan@abdn.ac.uk).

²Department of Earth Sciences, University of Cambridge, UK.

³Faculty of Natural Sciences and Resources, Universiti Malaysia Sabah, Sabah, Malaysia

North Borneo provides a unique natural laboratory for investigating post-subduction processes. It was the site of two subduction systems during the last 65Ma, which terminated ~23Ma and ~5-6Ma respectively. During the post-subduction phase the western side of North Borneo has experienced mountain building, which formed the Crocker Range (~20Ma) and the 4100m high Mt. Kinabalu, a large granite pluton emplaced relatively rapidly between 7.9 and 7.2Ma. While significant research has taken place to characterize the surface geology of North Borneo the extent to which this has been shaped by post-subduction tectonic processes remains unknown.

To address these questions, a new network of 46 broadband seismometers was deployed in March 2018 in a 40km by 40km grid across the Malaysian state of Sabah, as part of the North Borneo Orogeny Seismic Survey (nBOSS). The network consists of 28 Guralp 6TDs and 18 Guralp 3ESPDs deployed in schools, homes, plantations, and conservation areas, including one instrument high on Mt Kinabalu. Our network is complemented by data from 24 seismometers operated the Malaysian Metrological Service, many of which are located close to Mt Kinabalu. Such coverage by seismic instrumentation is unprecedented in this region, thus we will be able to provide the first high-resolution constraints on the structure of the crust and mantle in this post-subduction setting.