



## Voyage ss2012\_v02

### Northern Lau Transit Expedition (NoLauTE)

Richard J. Arculus, Australian National University (Chief Scientist)

#### Contribution to Australia's national benefit:

NoLauTE was a voyage of scientific exploration, studying a region where the relative motion between the Australian and Pacific plates is particularly complex. The types of volcanic and mineralising activity occurring in this zone is a modern example of the processes which have combined in the geological past to create some of Australia's greatest mineral wealth. Further to the temporal and spatial perspectives gained through study of the active processes, in themselves the products of current seafloor mineralising activity are potentially of commercial interest. In addition to samples from the seafloor, the Voyage recovered samples of seawater, both adjacent to mineralising hotspots and also as part of a broad study of movements of water masses in the southwestern Pacific, crucially important in terms of modelling of ocean circulation.

#### As a result of this voyage:

1. We have a better understanding of the way the Australian and Pacific tectonic plates interact around the north of the Fijian islands, linking zones of extremely rapid crustal formation and magmatic eruptions with accompanying mineralising hot-spring activity.
2. We have found zones of current magmatic and tectonic activity with implications for earthquake and tsunami activity, and potential precious and base metal-rich hot-spring activity.
3. We have mapped eight zones where new sea floor is being created with accompanying crustal extension and faulting, extending for a distance of ~1000km in an east-west direction north of the Fijian islands.
4. We have commenced a program of analytical geochemistry including trace elements and isotopic characteristics of the dredged natural volcanic glasses and rocks, and water samples obtained over the full range of ocean depths.

#### Itinerary

Departed Lautoka, Fiji,  
10.00, 12 May 2012

Arrived Lautoka, Fiji,  
10.00, 5 June 2012

#### > Voyage track ss2012\_v02

