



## **Geochemical signatures of tsunami deposits – what do they tell us?**

Catherine Chague-Goff and James R Goff

Australian Tsunami Research Centre, School of Biological, Earth and Environmental Sciences, University of New South Wales, Sydney 2052, NSW, Australia (j.goff@unsw.edu.au/+61 2 9385 1558)

In the last two and half decades, but even more since the 2004 Indian Ocean Tsunami (IOT), there has been a significant increase in the amount of literature dealing with recent, historical and palaeotsunamis. Much has been written and debated about the diagnostic criteria of historical and palaeotsunami deposits. Most of the diagnostic criteria or proxies used reflect the expertise of the researchers involved and thus tend to be biased towards sedimentology, stratigraphy and micropalaeontology, with some reference to geomorphology, archaeology, anthropology and palynology. It should however be noted that all criteria have never been reported from one site, and neither are they all found in one single deposit. Thus, the lack of one or more proxies should not be taken as unique evidence to refute the tsunamigenic origin of a specific deposit.

Although geochemical signatures have long been used as indicators for palaeosalinity in sedimentary sequences, there appears to have been some reluctance to use them to help in the identification of historical and palaeotsunami deposits. Like other proxies, geochemistry alone may not provide a definite answer to the origin of a deposit. Furthermore, poor preservation due to environmental conditions or as a result of post-diagenetic processes, might complicate the interpretation of geochemical signatures left by tsunami inundation. Similar taphonomic problems are also faced for microfossil proxies. However, geochemistry provides another piece to the puzzle, and together with other proxies, it can help identify palaeotsunami deposits. Geochemical signatures can also provide clues about the landward limit of runup of a tsunami, beyond the area of sediment deposition. This was recently documented following the 2004 IOT and the 2009 South Pacific tsunami.

A summary of examples of geochemical signatures recorded in interstitial water and sediment of recent, historical and palaeotsunami deposits is presented.