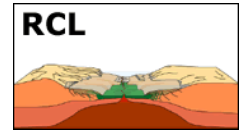


Large-Scale Seismic Structure in the Gulf of California from the NARS-Baja Array



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The NARS-Baja seismic array was installed in the region surrounding the Gulf of California in 2002 to determine the large-scale structure of the region and to monitor earthquakes. It is a cooperative project amongst Utrecht, CICESE and Caltech and will cease operation in 2008. Using these data we have determined receiver functions to determine the crustal thickness and they show that the crust thins by a factor of two towards the Gulf (Persaud et al, 2007). We have also imaged the shear wave velocity in the region by using surface waves from local and regional earthquakes (Di Luccio et al, 2006). These results, along with the seismic MCS and refraction surveys (PESCADOR experiment), the MCS survey of Gonzales, and the receiver function of Lewis et al (2000), have been combined into a model for the large-scale structure of the region that is shown in the figure. The results show that the athenosphere localizing near the ridges in the southern Gulf, while in the northern Gulf it is diffuse, indicating either the spreading process has been altered by the large sediment load from the Colorado River, or the extension is caused by stretching.

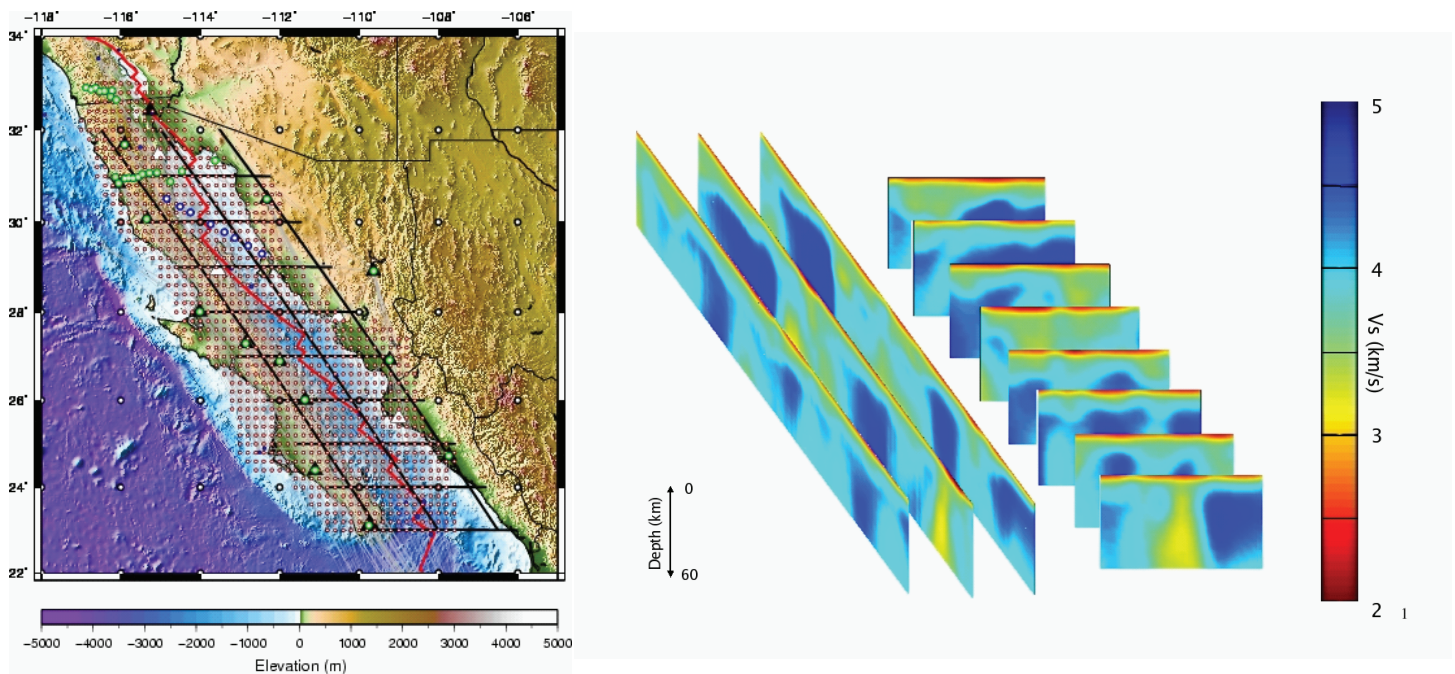


Figure: Large-scale model for the Gulf of California Region based on receiver functions and surface wave inversions. The triangles are the NARS-Baja stations and the green circles are locations of receiver functions. The depth panels in the right panel show the shear-wave velocity along transects denoted by the lines on the map. The southernmost E-W panels shows the sharp athenosphere anomaly associated with the spreading center, while the northernmost panel shows a diffuse athenosphere upwelling.

Persaud, P., X. Perez-Campos, and R. Clayton (2007), Crustal thickness variations in the margins of the Gulf of California from receiver functions, *Geophys. J. Int.*, 170, 2, 687-699, doi:10.1111 /j.1365-03412.x

Clayton, R. W., J. Trampert, C. Rebollar, J. Ritsema, P. Persaud, H. Paulssen, X. Perez-Campos, A. Van Wettum, A. Perez-Vertti and F. Di Luccio, 2004, The NARS-Baja seismic array in the Gulf of California rift zone. *MARGINS Newsletter*, 13, 1-4.

Clayton, R. W., F. Di Luccio, P. Peraud, Velocity Model for the Gulf of California, presented at the RCL-Margins workshop on Lithospheric Rupture in Gulf of California – Salton Trough Region, Ensenada, Mexico, Jan 9-13, 2006, <http://rd-cortez.nsf-margins.org>

