



## **Amphibious local seismic Observations by SFB 574 in Costa Rica**

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The goal of the SFB 574 "Volatiles and Fluids in Subduction Zones" subproject A2 is to study the seismogenic zone of Costa Rica and Nicaragua as examples of an erosive margin and to better understand its local variability. In 2002/2003 we studied the seismogenic zone in two adjacent areas of Costa Rica. One of the areas is characterised by the subduction of a seamount, the other one contains a megalens structure, which had been inferred from reflection seismic data before and which is interpreted to indicate a possible mechanism for mass transfer from the upper to the lower plate.

23 ocean bottom sensors from IFM-GEOMAR and 15 landstations from the GFZ Potsdam were deployed in the coastal Pacific region of central Costa Rica near Jaco in April 2002. The network was moved south-east towards Quepos in October 2002 and operated until spring 2003.

1,968 earthquakes between April and October 2002 could be located by the Jaco network. Most of the earthquakes took place offshore beneath the continental margin close to or beneath the network. The hypocenter determination of these events using the on- and offshore parts of the network delivers very precise earthquake locations, because the network covers the source region very well. Another region of high seismic activity is located southeast of the network, where a magnitude 6.3 earthquake took place on June 16, 2002, followed by several hundred aftershocks. Ongoing studies focus especially on the updip limit of these events. From the Quepos network 1,241 earthquakes between October and December 2002 have been located, so far.

In a pilot study focal mechanism of 13 earthquakes with clear polarities had been determined using the Jaco onshore network only. Except for two earthquakes these

events were shallow and took place in the continental wedge. The orientations of their focal planes coincides well with the geological fault system of the Jaco area. Ongoing work focuses on slab related earthquakes.