

## GPS observation in Nicoya seismogenic zone, Costa Rica

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Costa Rica is located on the western margin of the Caribbean plate. The Cocos Plate is subducting under the Caribbean plate along the Middle American Trench. The convergent rate between the Caribbean plate and the Cocos plate is about 90 mm/yr in this area [DeMets et. al., 1990].

The Nicoya peninsula, northwestern Costa Rica, constitutes a seismic gap is located on a subduction segment. This subduction segment has ruptured with large earthquakes in 1853, 1900 and 1950. Its strong coupling contrasts with the immediately adjacent weak segments: Nicaragua to the northwest and central Costa Rica to the southeast. The aftershock areas of the Costa Rica, 1990 ( $M_w = 7.0$ ) and Nicaragua, 1992 ( $M_w = 7.6$ ) earthquakes allowed the geographic extent of the Nicoya seismic gap to be clearly defined.

A strong interplate coupling in the Nicoya seismic gap is supported by the fast northeast motion (parallel to convergence) of the Nicoya peninsula (nearly 30mm/yr) observed with the Global Positioning System (GPS) [Lundgren et. al., 1999]. Without significant seismic slip since 1950, with a convergence rate around 88 mm/yr and an area ranging from 4600 to 9600 km, the Nicoya seismic gap has attained already the potential to produce an earthquake with moment magnitude above 7.5.

The presence of the peninsula over an earthquake rupture area is an advantage for monitoring this seismic gap. It is easy to deploy the instruments and maintain them. The crustal deformation, seismicity, and other geophysical phenomena are possible to be monitored continuously. Most of other interplate earthquakes related to the plate subduction occur under the sea floor. An observation of earthquake related phenomena has many difficulties and precision of analysis is restricted. An intense observation on Nicoya peninsula is very important to know the mechanism of subduction type earthquakes.

In this program, a new GPS survey line across Nicoya peninsula was constructed. This line consists 10 benchmarks from Punta Indio to Cerro San Jose and its length is about 80 km. A main object of this line is to estimate an extent of the interplate seismogenic locked zone. An extent of the earthquake fault zone is an important factor to estimate a scale of an earthquake and disasters caused by it. On the Nicoya peninsula, it is possible to observe crustal deformations just above the fault area.