

## **MARACAS ANR project: MARine terraces along the northern Andean Coast as a proxy for seismic hazard ASsessment**

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In subduction zones, the sum of the cyclic deformation over many seismic cycles account for the long-term cumulated deformation of the forearc in the upper plate. Along the Andean coast, many studies have suggested a correlation between seismic segmentation of the megathrust and a morpho-tectonic segmentation of the forearc. Large megathrust earthquakes tend to occur on highly coupled patches on the seismogenic zone right below forearc basins. These basins are framed in between coastal peninsulas, identified as seismic barriers that stop seismic ruptures. Long-term vertical coastal movements appear in peninsula areas where the slip along the plate interface is mostly achieved by creeping. This indicates that surface expression of deformations in the long-term might be linked to the seismic regime on the megathrust whose along-strike variation seems stable through times. We wonder if we could resolve the inverse problem: could we use upper plate deformation and active structures characterization for assessing safely the margin segmentation, rupture lengths and seismic hazard? Hence the MARACAS project newly funded by the French National Research Agency proposes to develop an interesting improvement to assess seismic hazard in subduction zone that would take into account the survey of the long-term deformation of the upper plate to better identify multicycles margin segmentation. Here, we propose to introduce the MARACAS project objectives, scientific question, impacts and outreach activities. We aim 1) to identify the conditions of vertical crustal motions along the plate boundary; 2) to evaluate the lateral impact of seismic ruptures on forearc deformation in weakly coupled segments below peninsulas; and 3) to determine whether the correlation between the seismic segmentation and the morpho-tectonic segmentation is fortuitous or long-lasting.