Fist detection of shallow tremor at the Guerrero gap, Mexico.

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The Guerrero gap, located at the Mexican subduction zone, is a seismic gap which has not had any significant earthquake (M>7) in almost 119 years. Furthermore, slow earthquakes like tectonic tremors and slow slip events are frequent in the down dip portion of the gap at approximately 40 km depth. Even when slow earthquakes in the Guerrero gap are well documented, until now there has been no confirmation of slow earthquake activity at the shallow portion of the gap close the trench. With no offshore instrumentation, it has been a difficult task to collect enough evidence to prove that tremors or slow slip take place near the trench. For this reason, a seven stations array of Ocean Bottom Seismometers (OBS) was deployed inside the Guerrero gap. One-year data was analyzed in search of shallow tremors using a modified envelope correlation method. Over 130 tremors were detected close to the trench. Tremors do not show any migration, but small burst of tremors show recurrence periods of approximately one and three months. Seismic signals of these tremors have duration between 10-100 sec, they show no clear arrivals both of P and S wave, are efficient at a frequency band between 2 and 8 Hz and are deficient at frequencies above 10 Hz, attenuating rapidly. More analysis is being done to understanding the nature of these tectonic tremors and their connection with seismicity. By comparing other seismic and geodetic data, such as ocean bottom pressure gauges, GPS/acoustic measurements and high-resolution bathymetry, we are now trying to explain tremor influence in the seismic hazard associated to the shallow portion of the GG.

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