Improvement on Puerto Rico Seismic Network Capabilities for Monitoring Seismic and Aseismic Deformation in Southeastern Puerto Rico

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The Puerto Rico Seismic Network (PRSN) has received funding from the Federal Emergency Management Agency (FEMA) to improve its capability to monitor seismic and aseismic deformation in Southeastern Puerto Rico through the installation of three (3) real-time seismic-geodetic stations. One station will be equipped with a broadband seismometer while intermediate period sensors will be placed at the two (2) other stations. Two permanent GPS instruments and three accelerometers will be co-located with the seismic instruments. Each GPS station will meet Plate Boundary Observatory (PBO) standards. We will be presenting ambient background noise analysis for the temporary seismic station installed at two (2) of the proposed sites.

The programed upgrade on PRSN monitoring capability is necessary due to a dramatic (194%) increase on seismic activity in Southeastern Puerto Rico during 2006-2008 in comparison with the previous 20 years which cannot be associated with modifications on network coverage or detection algorithms. The microseismic activity, occurring as earthquake swarms at depths of 4.0 to 8.0 km in a landslide prone area, is being reported as felt by residents in the nearby towns with maximum intensity of V, Modified Mercalli Scale. In addition, the Anegada Passage, offshore south-east Puerto Rico, was the locus of the 1867 major earthquake which generated a tsunami with 20 feet run-up in the Virgin Islands.

PRSN operations will benefit from this upgrade by improving earthquake detection capability, increasing location accuracy, availability of a broader spectrum to perform waveform analysis and improving data quality and coverage for detailed geophysical studies.