

Surface and Subsurface Characterization of a Fault along Boso-Boso River, Rizal

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Abstract : The Philippines is a tectonically active archipelagic country situated near the Circum-Pacific Belt. Hence, seismic hazard assessments are important in the nation-building. In 2014, the Philippines Institute of Volcanology and Seismology (PHIVOLCS) mapped a 12-km NW-trending unnamed active fault near Boso-Boso River, Rizal. Given the limited nature of their technical report, they would like to further consolidate relevant data about this fault. As such, this study aims to characterize the surface and subsurface expression of the fault along Boso-Boso River using range-front morphology, structural criteria, and ground penetrating radar. This fault is subdivided into two segments: the first segment located in the city of Antipolo is mainly manifested in the upper Kinabuan Formation and terminating near Mt. Qutago, and the second segment in Baras, Pinugay, Rizal cuts through recent fluvial deposits and to the Guadalupe Formation. IfSAR-derived DTM data reveals the morphological expression of the fault defined by offset streams and ridges, linear sidehill valleys, and linear valleys. Fault gouges, fault breccia, transtensional flower structures, slickensides, and other shear sense markers observed in the units of the upper Cretaceous Kinabuan Formation indicate a sinistral sense of displacement. GPR radargram profiles revealed the presence of displacement in reflectors at 3-5 meters below the surface which may be suggestive of the fault within the area. Finally, the fault in Boso-Boso river may be a segment of the larger sinistral Montalban Fault in the north or largely affected by the movement from the Marikina Valley Fault System.

Keywords : NW unnamed fault, range-front morphology, shear sense markers, ground penetrating radar, boso-boso river, antipolo

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