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A basic tool for post-seismic rebuilding: the new 1:5.000 scale geological map of Amatrice town

Marco Mancini (1), Gianluca Vignaroli (1), Francesca Ardizzone (2), Francesco Bucci (2), Mauro Cardinali (2), Gian Paolo Cavinato (1), Giuseppe Cosentino (1), Cristina Di Salvo (1), Federica Fiorucci (2), Iolanda Gaudiosi (1), Silvia Giallini (1), Edoardo Peronace (1), Federica Polpetta (1), Maria Luisa Putignano (1), Paola Reichenbach (2), Michele Santangelo (2), Veronica Scionti (1), Maurizio Simionato (1), Pietro Sirianni (1), Francesco Stigliano (1), and the CNR IGAG-IRPI Seismic Microzonation Team

(1) Consiglio Nazionale delle Ricerche, Istituto di Geologia Ambientale e Geoingegneria, Monterotondo Scalo, Italy, (2) Consiglio Nazionale delle Ricerche, Istituto di Ricerca per la Protezione Idrogeologica, Perugia, Italy

A geological survey has been carried out in the area of Amatrice, the most damaged town after the 24 August 2016 event, to provide a basic reference for geophysical and geotechnical data useful for seismic response analyses and microzonation studies.
The morphologies and the stratigraphic-structural setting of the investigated area are detailed on a 1:5000 scale geological map and cross sections, which derive from the integration of field-based observations and photo-geological interpretation.
The Amatrice basin is filled by the one km-thick Laga Formation, composed of Messinian syn-orogenic marine sandstones and siltstones (Marini et al., 2015) and covered with disconformity by Quaternary conglomerates and sands, referred to alluvial fans, fluvial terraces and landslides. Presently, the Amatrice basin is a structurally-controlled depression bounded eastward by the Gorzano Mt ridge, and westward by the Sibillini Mts thrust front (Koopman, 1983).
Our observations focus on (i) relationships between geometry and extent of cover deposits, (ii) bedding of the substratum, and (iii) areal arrangement and distribution of the main fault systems.
Amatrice is located on a N-S trending mesa bounded by steep escarpments. The siliciclastic substratum was folded by syn-orogenic movements, broadly forming a NW-SE-trending synform, and is dissected by two main fault systems of the Plio-Quaternary post-orogenic tectonics. The first system consists of N-S striking high angle normal fault segments, each one having continuous length of up to 2 km; the second consists of E-W-striking normal-to-strike slip fault systems dissecting the first one. N-S-striking faults are morphologically expressed by fault plane scarps and triangular facets, and control the areal distribution of the Quaternary fluvial deposits. These are up to 50 m thick below Amatrice and thin to few metres along the north west direction. East of Amatrice, the stratigraphic setting is dominated by SW-prograding alluvial fans, downlapping the substratum, while on the West the stratigraphic setting is strongly complicated by large scale deformations (folding and tectonic repetitions) produced by shortening mechanisms.
The recognized morphological irregularities, stratigraphic heterogeneities, and structural alignments are considered critical elements to define, at local scale, subsoil models useful for evaluating seismic amplification effects.

References

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