



A critical review of seismotectonic setting of the Campanian Plain (Southern Italy) in GIS environment.

germana gaudiosi, giuliana alessio, paola luiso, rosa nappi, and patrizia ricciolino

Ist. Naz. di Geofisica e Vulcanologia – Osservatorio Vesuviano, Napoli, Italy (rosa.nappi@ov.ingv.it)

The Plio-Pleistocene Campanian Plain is a structural depression of the Southern Italy located between the eastern side of the Tyrrhenian Sea and the Southern Apennine chain. It is surrounded to the North, East and South by the Mesozoic carbonate massifs of the Apennine chain and, to the West, by the Tyrrhenian Sea.

The graben origin is similar to other peri-Tyrrhenian regions and is related to a stretching and thinning of the continental crust by the counterclockwise rotation of the Italian peninsula and the contemporaneous opening of the Tyrrhenian sea. The consequent subsidence of the Campanian carbonate platform took place along the Tyrrhenian coast during the Plio-Pleistocene with a maximum vertical extent of 5 km. The plain is filled by volcanic and clastic, continental and marine deposits.

Voluminous volcanic activity of Roccamonfina, Campi Flegrei, Ischia, Procida and Vesuvio occurred in the Plain during the Quaternary.

In the middle of the plain lies the city of Naples, bordered by the two active volcanoes of Campi Flegrei and Vesuvio. It is a very densely inhabited area that is exposed to high potential volcanic risk.

The stress field acting in the Campanian area is poorly known. Structural observations on the Pleistocene faults suggest normal to sinistral movements for the NW–SE-trending faults and normal to dextral for the NE–SW-trending structures. These movements are consistent with those of the structures affecting the inner margin of the Southern Apennines.

The Campanian Plain is characterized by seismicity of energy lower than the seismic activity of the Southern Apennine chain. The earthquakes mainly occur along the margin of the plain, in the volcanic areas and a minor seismicity spreads out inside the Plain.

The aim of this paper is an attempt to identify active, outcropping and buried fault systems of the Campanian plain through the correlation between seismicity and tectonic structures.

Seismic, geologic and geomorphologic data have been analysed in GIS environment.

In particular, the seismological data used in this study are relative both to the historical and recent seismic activity, collected by the following Catalogues: CPTI04 Catalogue of Parametric Italian Earthquakes, 2004 (217 b.C to 2002); CSI Catalogue of Instrumental Italian Earthquakes (1981-2002); CNT Seismic Bulletin of Istituto Nazionale di Geofisica e Vulcanologia (2003-2008); Data Base of Seismic Laboratory of Osservatorio Vesuviano (Istituto Nazionale di Geofisica e Vulcanologia) (2000-2009); SisCam Catalogue (Seismotectonic Information System of the Campanian Region) (1980-2000). Seismic data were homogenized in an only one Catalogue. The seismicity of Campi Flegrei and Vesuvio volcanoes have not been studied.

The Geological Dataset consists of a merge of all outcropping and buried faults extracted from the available geological and structural maps: Geological map of Italy 1:100.000; Geological map of Southern Italy 1:250.000; Neotectonic Map of Italy 1:500.000; Structural Map of Italy 1:500.000.

Two main NW-SE and NE-SW active fault systems have been identified from the joined analysis of seismic epicentres and faults. Moreover, tectonic structure without correlated seismic activity and a spread seismicity, apparently not linked with already known structures (buried faults?), have been identified.