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Geological causal factors of soil gas radon concentration in Calabria (Southern Italy)

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In the past decades, several studies were aimed at defining the relationships between neotectonics and seismicity, and between neotectonics and morphoevolution in Calabria (Southern Italy). More recently, also in cooperation with other colleagues of the CNR-IRPI, our group performed a "combined" analysis of deep-seated morphoevolution, neotectonics and seismicity, and soil-gas radon concentrations in the Crati Graben (Northern Calabria). Similar combined analyses have recently been extended along the NE border of the Sila Massif (again in Northern Calabria), and in the "Stretta di Catanzaro" area (Central Calabria). A more detailed analysis has also been performed in the vicinity of the Acri (CS) village, in the Sila Massif, a study site located on the right flank of the Crati Graben. In the mentioned study areas deep-seated gravitational deformations and large-scale landslides, and tectonic structures have been mapped in scale 1/10,000, by means of air-photo interpretation and field examinations. Successively, geological features have been compared with values of soil gas radon concentration, which have been sampled and analysed for the same sectors through geostatistical methods. By cross-analysing the above mentioned geo-environmental items, new insights have been gained into geological hazards related to slope-stability, seismogenesis, and radon emission, and on their mutual relationships. In the present study, the main results of the cited analyses are described, with comparisons of the results obtained in the different study areas. In brief, we found that radon anomalies generally correspond to sectors of severe crustal deformation - i.e. where either neotectonic features or gravitational-tectonic processes, deep-seated gravitational de-

formations, or large-scale landslides are to be found. Highest radon values match well with active faults, and with macroseismic areas of the main historical earthquakes. On the contrary, large non-diastrophic deformations generally tend to conceal geomorphologic evidence of recent faults, as well as associated Radon anomalies.