



## **Typology and distribution of sinkholes in the plain areas of Southern Italy**

S. Del Prete (1), G. Iovine (2), M. Parise (3), and A. Santo (4)

(1) Freelance geologist, Caserta, Italy, (2) Institute of Research for Hydrogeological Protection, National Research Council, Cosenza, Italy, (3) Institute of Research for Hydrogeological Protection, National Research Council, Bari, Italy (m.parise@ba.irpi.cnr.it, +39 080 592 9611), (4) Dept. Hydraulic, Geotechnical and Environmental Engineering, University "Federico II", Naples, Italy

Sinkholes represent a very subtle hazard in karst areas, and often pose serious threat to population and anthropogenic environment. Cases which open, even without any premonitory sign, as rapid, catastrophic failures (collapse and/or cover collapse sinkholes) may result in severe economic losses and, most important, in casualties. In the last years, researches on sinkhole phenomena and related effects have significantly increased in Italy, in the aftermath of some remarkable events occurred in different regions, from Tuscany (Camaione in October 1995) to Apulia (Gallipoli in March 2007). Aimed at recognizing and analysing the peculiar stratigraphical and morphological conditions which lead to sinkhole occurrence in Southern Italy, a review of events occurred in the plain areas of Campania, Apulia and Calabria is discussed in this study. The three considered regions are, in fact, suitable for a comparative analysis, due to presence of a good variety of environmental conditions.

In Campania, the filling deposits of the plains are represented by alluvial deposits, intercalated with volcanoclastic materials. Sinkholes are generally located along of the Tyrrhenian margin of the carbonate massifs or within intramontane basins, and are 25-30 m deep. Some of them occurred in the vicinity of urban centres causing serious hazard conditions (such as in the case of Telesse village) are described in detail.

In Apulia, a flat region almost entirely interested by outcropping of soluble rocks, some cases affecting the calcarenite rocks overlying the limestone bedrock are examined, together with other cases involving Triassic evaporite rocks.

In Calabria, one of the most seismogenic Italian regions, the relationships between strong historical earthquakes and occurrence of sinkholes are analyzed; nevertheless, other events of sinkholes related to meteoric events, rather than seismic shocks, are also considered.

The article intends to provide a first glance on the variety of sinkhole phenomena in Southern Italy, aiming at highlighting the possibility of sinkhole events in large sectors of the considered regions, even in areas where such hazard has never been considered at all.