



## **Determining priorities of a remediation plan at urban scale by assessing the risk of metals and POPs for local population: The Acerra-Pomigliano-Marigliano conurbation case study in Italy.**

Stefano Albanese (1), Annamaria Lima (1), Carmela Rezza (1), Shihua Qi (1), Chengkai Qu (2), Wei Chen (1), and Benedetto De Vivo (2)

(1) Università degli Studi di Napoli "Federico II", Università degli Studi di Napoli "Federico II", Earth Sciences, Environment and Resources, Naples, Italy, (2) China University of Geosciences, State Key Laboratory of Biogeology and Environmental Geology, China University of Geosciences, 430074 Wuhan, People's Republic of China

In the framework of the URGE (Urban Geochemistry) project aiming at depicting the environmental conditions of several cities in Europe, the north-eastern sector of the Naples metropolitan area (Italy), namely the Acerra-Pomigliano-Marigliano area (with ~160.000 inhabitants), has undergone a geochemical characterization based on topsoil sampling (145 samples over an area of 90 sqkm).

The conurbation includes 6 municipalities (Acerra, Pomigliano D'Arco, Castello di Cisterna, Bruscianno, Marigliano and Marigliano) and considering the total extension of the urbanized areas (18-20 sqkm) the average population density could be corrected to 6-7000 inhabitants/sqkm.

Soils of the area are mostly originated by the pedogenesesis of the original pyroclastics produced by the Mt. Somma-Vesuvius volcano on the south-western side of the study area.

The area has been selected because of both the presence of an historical industrial settlement on it (mainly devoted to plastic materials and synthetic fibers production) and of an incinerator which came into operation in March 2009.

The main objective of the study was 1) to define the local geochemical baselines both for 53 elements (among which the toxic ones) and for some organic compounds, including PAHs, PCBs and OCPs and 2) to assess the environmental risk generated by polluted soils. Furthermore, the study aimed at supporting epidemiological researches and at establishing a record of the environmental status quo ante to evaluate in the future the impact of the incinerator on life quality and on health of local population.

Obtained results showed that most of the urbanized areas of the Acerra-Pomigliano-Marigliano conurbations are characterized by concentrations of Pb, Zn and V exceeding the intervention limits established by the Italian Environmental law (D.Lgs. 152/2006). Agricultural soils, in the surroundings of the urbanized areas, are enriched in Cu, Co, Cd, Be and Ni, and the probable presence of illegal waste disposals in the area should be considered as a source for them. In the area where the incinerator has been built Se, Hg, Cu, Cd and Sb baselines are generally higher than in the rest of the territory.

Benzo(a)pyrene, benzo(g,h,i)perylene and indeno(123-cd)pyrene are the most concentrated PAHs in urbanized areas and they are characterized by concentrations exceeding the Italian guidelines.