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Population exposed to landslide risk in Italy

Alessandro Trigila (1), Carla Iadanza (1), Michele Munafò (1), Fabio Baiocco (1), Ines Marinosci (1), Raffaella Chiocchini (2), and Stefano Mugnoli (2)

(1) ISPRA - Italian National Institute for Environmental Protection and Research, Rome, Italy (alessandro.trigila@isprambiente.it), (2) ISTAT - Italian National Institute of Statistics, Rome, Italy

Italy is one of the European countries most affected by landslides counting over 486,000 mass movements with a total area of 20,700 square kilometres equal to 6.9% of the national territory. Moreover Italy is a densely urbanized country: 8101 municipalities, about 200 inhabitants per sq. km, 16,000 km of rail network and 180,000 km of road network. Landslides caused more than 5000 fatalities in the last century and considerable damage to urban areas, transport infrastructure and facilities, environmental and cultural heritage. The aim of this work is to estimate the population exposed to landslide risk in Italy. The input data are: the Italian Landslide Inventory, the Italian Population Census data and the high-resolution Artificial surfaces-Imperviousness Layer (Geoland2). The Italian Landslide Inventory (Progetto IFFI) realised by ISPRA (Italian National Institute for Environmental Protection and Research) and the Regions and Self-governing Provinces, identifies landslides occurred in the national territory in accordance with standardized methods and using a detailed landslide mapping (1:10,000 scale). The 14th Population Census, made by ISTAT (Italian National Institute of Statistics) in 2001, contains data of resident population for the 382,534 census tracts in which Italy is divided. The pan-European high-resolution (HR) Artificial surfaces-Imperviousness Layer, realized using remote sensing data within the GMES initiative (Global Monitoring for Environment and Security) by European Commission and European Space Agency, contains the degree of imperviousness (between 0 and 100%). GIS overlay of this information layer (20 x 20 m grid) with census tracts has allowed the spatialization of population within urban settlements of each census tract. This methodology has been particularly useful in the case of rural census tracts characterized by large surface area and low population density. The methodology could be also applied to estimate the population exposed to other natural, environmental or technological risks.