



Mapping the geogenic radon potential of the eastern Canary Islands.

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The main contribution of indoor radon comes from soils and thus, the knowledge of the concentration of this gas in soils is important for estimating the risk of finding high radon indoor concentrations. To characterize the behavior of radon in soils, it is common to use the a quantity named Radon Potential which results of a combination of properties of the soil itself and from the underlying rock, such as concentration and distribution of radium, porosity, permeability, the moisture content and meteorological parameters, among others. In this work, the results three year of campaigns of measurement radon gas as well as the permeability in soils of the Eastern Canary Islands (Gran Canaria, Fuerteventura and Lanzarote) are presented. By combining these two parameters and through the use of geostatistic interpolation techniques, the radon potential of soils is estimated and it is used to carry on a classification of the territory into hazard zones according to their potential for radon emanation. To measure the radon soil gas a probe equipped with a "lost" sharp tip is inserted to the desired sampling depth. One of the characteristics of the Canary Islands is the absence of developed soils and so the bedrock is found typically at very shallow depth. This fact has led us to adopt a sampling depth of 50 cm at most. The probe is connected to the continuous radon monitor Durridge RAD7 equipped with a solid-state alpha spectrometer to determine concentration radon using the activity its short-lived progeny. Dried soil air is delivered to the RAD7 radon monitor by pumping. A half hour counting time for all sampling points has been taken. In parallel to the radon measurement campaign, the permeability of soils has also been determined at each point using the permeameter RADON-JOK. The principle of operation of this equipment consists of air withdrawal by means of negative pressure. The gas permeability is then calculated using the known flow of air flowing through the probe using a calibrated nomogram. As results, maps of radon in soils have been developed for the three islands to identify areas where may appear high activity concentrations of radon due to natural sources. Finally to determine the radon potential of soils analyzed we applied a procedure to classify the radon areas in several levels of risk using the measured values of radon activity concentration and soil permeability.

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