

## Carbon dioxide manifestations and related hazard along the Hellenic territory

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Like other geodynamically active areas also the Hellenic territory is affected by a large number of geogenic gas manifestations. These occur either in form of point sources (fumaroles, mofettes, bubbling gases) or as diffuse soil gas emanations.

Geogenic sources release huge amounts of gases, which, apart from having important influences on the global climate, could have strong impact on human health. Gases have both acute and chronic effects. Carbon Dioxide and Hydrogen Sulphide are the main gases responsible for acute mortality due to their asphyxiating and/or toxic properties.

Gas hazard is often disregarded because in fatal episodes connected to geogenic gases the death cause is often not correctly attributed. Due to the fact that geodynamic active areas can release geogenic gases for million years over wide areas, it is important not to underestimate potential risks.

The present work produced a first catalogue of the geogenic gas manifestations of the whole Hellenic territory also considering literature data. Carbon dioxide dominated manifestations are the majority (61 out of 81). Most of them are found along the South Aegean Active Volcanic Arc. Many sites are also found in northern Greece and along the Sperchios basin - north Evia graben (central Greece) which are characterised by extensional tectonic activity. A preliminary estimation of the gas hazard has been made for the time period of the last 20 years considering the whole population of Greece. In this period at least two fatal episodes with a total of three victims could be certainly attributed to geogenic gases (specifically carbon dioxide). This would give a risk of  $1.3 \times 10^{-8}$  fatalities from geogenic gas manifestations per annum. Of course this risk is unevenly distributed along the whole Hellenic territory and it will depend on many factors. The most important factor will be the geographical distribution of the natural gas manifestations while also the strength of the source, the chemical composition of the gases, the meteorological conditions and the topography of the area will contribute to the determination of the local risk. The assessment of the geographical distribution of the risk levels is a difficult task, but the present catalogue of the gas manifestations of the natural gas manifestations of Greece will be a contribution to its determination.

Since deaths due to natural gases are often wrongly attributed we cannot exclude that some fatal episode has not been recognized and thus that the risk is somewhat higher than that here assessed. Although very low this risk has not to be neglected, not only because possibly underestimated but also because simple countermeasures could be adopted. Dangerous area can be easily identified and delimited by geochemical prospections and their hazard properly evidenced.