Soil hazards related to shale gas activities

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In 2010-2015 dozen of unconventional hydrocarbons wells were drilled in Poland. These earliest cases of new industrial activity in Europe were carefully observed and monitored both by the society and scientific community. One of the biggest and most comprehensive researches on environmental impact posed by the activity was the one conducted by a scientific consortium led by the PGI-NRI. The outcomes of this study are still relevant as a basic data for environmental impact assessment and ought to be more widely used for analysis and comparisons as they documented real case studies involving local factors and conditions.

With this presentation, issues related to soil will be discussed, including sub-soil compaction (due to overburden from infrastructure and topsoil temporary storage heaps) as well as contamination by accidental spills of chemicals and technological fluids. Both chemical and agricultural properties of soils have been tested.

Within the study, contents of methane and others light hydrocarbons in soil gas were considered as possible indicators of stray gases migration towards the land surface from deeper formations. Thus, such gases survey was conducted with concentrations as well as isotopic characteristics analysis. According to the results a peculiar and unexpected phenomenon of increased methane concentration under site protective impermeable coverage were observed. It is supposed to be caused by a mix of local geological conditions and land-use pattern.

Based on real study results a need for baseline conditions establishment as well as continuous soil properties monitoring is needed in order to protect the soil itself as well as to have a tool for unwanted substances migration indicator. For both purposes proper sampling strategy recommendation need to be elaborated.