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Mercury emissions from coal combustion in Silesia, analysis using geostatistics

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Data provided by the UNEP's report on mercury [1] shows that solid fuel combustion in significant source of mercury emission to air.

Silesia, located in southwestern Poland, is notably affected by mercury emission due to being one of the most industrialized Polish regions: the place of coal mining, production of metals, stone mining, mineral quarrying and chemical industry. Moreover, Silesia is the region with high population density. People are exposed to severe risk of mercury emitted from both: industrial and domestic sources (i.e. small household furnaces). Small sources have significant contribution to total emission of mercury.

Official and statistical analysis, including prepared for international purposes [2] did not provide data about spatial distribution of the mercury emitted to air, however number of analysis on Polish public power and energy sector had been prepared so far [3; 4]. The distribution of locations exposed for mercury emission from small domestic sources is interesting matter merging information from various sources: statistical, economical and environmental.

This paper presents geostatistical approach to distibution of mercury emission from coal combustion. Analysed data organized in 2 independent levels: individual, bottom-up approach derived from national emission reporting system [5; 6] and top down – regional data calculated basing on official statistics [7].

Analysis, that will be presented, will include comparison of spatial distributions of mercury emission using data derived from sources mentioned above. Investigation will include three voivodeships of Poland: Lower Silesian, Opole (voivodeship) and Silesian using selected geostatistical methodologies including ordinary kriging [8].

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