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Mercury Slovenian soils: High, medium and low sample density geochemical maps

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Regional geochemical survey was conducted in whole territory of Slovenia (20273 km2). High, medium and low sample density surveys were compared. High sample density represented the regional geochemical data set supplemented by local high-density sampling data (irregular grid, n=2835). Medium-density soil sampling was performed in a 5 x 5 km grid (n=817) and low-density geochemical survey was conducted in a sampling grid 25 x 25 km (n=54). Mercury distribution in Slovenian soils was determined with models of mercury distribution in soil using all three data sets. A distinct Hg anomaly in western part of Slovenia is evident on all three models. It is a consequence of 500-years of mining and ore processing in the second largest mercury mine in the world, the Idrija mine. The determined mercury concentrations revealed an important difference between the western and the eastern parts of the country. For the medium scale geochemical mapping is the median value (0.151 mg /kg) for western Slovenia almost 2-fold higher than the median value (0.083 mg/kg) in eastern Slovenia. Besides the Hg median for the western part of Slovenia exceeds the Hg median for European soil by a factor of 4 (Gosar et al., 2016).

Comparing these sample density surveys, it was shown that high sampling density allows the identification and characterization of anthropogenic influences on a local scale, while medium- and low-density sampling reveal general trends in the mercury spatial distribution, but are not appropriate for identifying local contamination in industrial regions and urban areas. The resolution of the pattern generated is the best when the high-density survey on a regional scale is supplemented with the geochemical data of the high-density surveys on a local scale.

References:
Gosar, M, Šajn, R, Teršič, T. Distribution pattern of mercury in the Slovenian soil: geochemical mapping based on multiple geochemical datasets. Journal of geochemical exploration, 2016, 167/38-48.