Spatial distribution of trace metals in soils of southwestern France

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Soils are critical environments and interface of rock, air and water. They are subject to anthropogenic pressure with input of trace metals, notably. Also modern technologies imply the emission of emerging potentielly toxic emerging contaminants such as Technology-Critical Elements (TCE) which include Platinum Group Elements (PGE). In France, a national soil monitoring network (RMQS: Réseau de Mesure de la Qualité des sols) was developed. The network is built on a systematic on a 16×16 km systematic grid covering the whole territory and enabled assessment of trace metals contamination. Therefore our aim is to determine concentrations, spatial distribution trends and origin of several trace metals including PGE by using the soil network on a regional scale. 356 surface soil samples were collected from the RMQS inside the Nouvelle Aquitaine administrative region (90 293 km\textsuperscript{2}). Exploratory data analysis, multivariate analysis and geostatistics were used to identify trends in spatial variability and origin of the elements. GIS databases have been crossed to establish maps and identify the possible origin of contamination. Boxplots show anomalies for all studied trace metals. Cu, Cd and As have the highest numbers of anomalies. Results from principal component analysis indicate strong correlation between Ni, Cr, Fe and clay content, supporting a geogenic origin of Ni and Cr. GIS maps and data showed a strong relationship between Cu anomalies and soil with a vineyard occupation, As anomalies and mining activities, Cd and Ni anomalies and Jurassic limestone bedrock. Spatial variability was assessed with variograms. PGE analysis is still in progress.

Note from the candidate for the Comitee Demolon: the abstract submission deadline is the 29\textsuperscript{th} March 2019. Notification of acceptance is not expected until the end of April 2019. Oral presentation will be preferentially asked for this abstract.