A Geochemical Modeling approach in Lardosa region (Castelo Branco, Portugal): an environmental management tool

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Geochemical cartography is a goal in mining prospection since the late 20's of the past century. More recently with the remarkable development of the analytical methods, the implementation of a geochemical mapping became a strong possibility, working as a tool in natural resources management.

Geochemical modeling in environmental applications is mostly oriented to the recognition and quantification of anthropogenic impacts. An accurate characterization of the natural background values is an essential and unavoidable step to evaluate the input of mining activities in the environment.

Fitting a geochemical model, in an old abandoned mining region - Lardosa region - concerning mainly to heavy metals contamination (Fe, Ba, P, Cu, Cr, B, Zn, Sb, Pb, Sn, Ni, Mn, Be, Mo, Co, Y, Cd, Nb and U), using a dataset of 646 samples of stream flow sediments, is the core of this study, which highlights the importance of mapping the environmental risk associated to old mining activities, using adequate ArcGis tools.

The study of stream flow sediments, collected in the abandoned Lardosa Sn – mining area from 1980 to 1988, has the main purpose of achieving a geochemical mapping intended to work as a management tool in mining prospection.

The studied area is mainly composed of schist and greywacke from the metasedimentary complex - "Schist – Metagreywacke Complex" that was intruded by the Castelo Branco granitic pluton. The intense weathering of the Lardosa granite promoted the mobility and accumulation of cassiterie and ilmenite that represent the "Lardosa Deposits". The tungsten (W) and tin (Sn) mineralizations occur in quartz veins and bundle veins with Fe, Cu and As sulfides that are related to the granite intrusion.

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