Environmental characterization of mining-related areas using RPAS-based multispectral images.

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Multispectral images offer information that can be of intertest in order to assess the environmental affection of areas were mining activity has been carried out. Besides, the usage of RPAS technologies (drones) has reduced the costs of surveys involving reduced-scale areas such as mining areas, and it represents an important tool to recognize the real effects of mining activity on local soils.

In the present communication we present data from two areas, located in Spain and Portugal, impacted by this activity, and in particular, by the absence of any remediation measures in the area. The assessed areas correspond to the San Quintín area, located in Central Spain (Ciudad Real province; some XX Km to the West of the World's famous Almadén mercury mining district; and Sao Domingos area, located in South Portugal, in the context of the Iberian Pyrite Belt.

In Sao Domingos we used a Sony conventional camera, obtaining the visible spectra (orthoimages). Meanwhile, in San Quintín we used a Sequoia high- resolution multispectral sensor, which low weight makes appropriate for usage in drone surveying. It covers the following discrete bands: 1 Green (550 nm); 2 Red (660 nm); 3 Red Edge (735 nm); and 4 Near Infrared (790 nm). These bands allowed the determination and surface mapping of the following parameters related with agronomic characteristics of the surveyed area: Ratio Vegetation Index (RVI); Normalized Difference Vegetation Index (NDVI); Green-Normalized Difference Vegetation Index (GNDVI); and Normalized Red Green Difference Index (NGRDI). Resolution corresponded to 13 cm/pixel, at 120 height (AGL). Conventional (visible) data offers information which is useful for a general delimitation of the affected areas, with higher resolution than any other images, including satellite images. On the other hand, multispectral very high-resolution mapping of the affected areas offers a detailed information on the status of the vegetal cover, and so, of the general degree of affection of the mining activities to the local soils.