

Mapping of iron ore deposits Using Landsat 8 multispectral images in Gara Djebilet (South-West Algeria).

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Gara Djebilet iron ore is the most important in Africa, is situated in the southern part of Algeria in the boundaries with Mauritania. The surrounding Djebilet zone is hardly accessible, the geomorphologic and climatic condition are not favorable to achieve a good geologic and mineralogical investigation. Adding to this, the instable security situation in this area that form a real obstacle to the mineral resource mapping in the region. Remote sensing using the Landsat multispectral images are known as a best way to map the iron deposits, especially in that condition. The ferric outcrops characterized by an absorption range at $0.9 \mu\text{m}$, which refer to the band 4 in the Landsat 8 images. The use of ratios bands allow to as improving the contrast between the Emsian formations and the iron ore deposits. Some mathematic operations can applied (addition, subtraction and more complicated as principal component analysis). The combination between this operations allow to us the elaboration of the iron ore index, this index based on the variation in the reflectance, the index " $2 \cdot b_7 / b_4$ " extract the iron formation, and omit other formations. The result images can vectorized and advanced treatment in GIS allow us estimating the deposits.

Key words: Remote sensing; Landsat 8; OLI; Gara Djebilet; Iron ore