

Essay of reconstitution of the surfacial geology of Ouargla Basin - south Algeria

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This work is the result of combination of field work, remote sensing data, the visual description and analytical data of samples of surface formations executed on the study area.

In this area the sedimentary layer of a thickness of 5000 m is represented by the Palaeozoic, Mesozoic and Cenozoic deposits. The Paleozoic deposits from the sandy Cambrian to the lower Devonian clay-sandstone where sandy levels are inserted through an radioactive clayey Silurian and an clayey-sandstone Ordovician. The Mesozoic is represented by the continental Triassic delimited at the base by the Hercynian unconformity and at the roof by the saline S4 level. The Cretaceous characterized by the emplacement of detrital deposits at the base and carbonates at the top. The Cenozoic is incomplete, unconformable and represented by continental deposits of Mio-Pliocene.

Digital processing has allowed a non-supervised classification then a supervised classification of the satellite image and brings out at the end of treatment a thematic representation of superficial geological formations according to their spectral signatures. The final map is checked and validated on the basis of field data (sites visits and cored survey data) and analytical data (physico-chemical analysis), to achieve at the end to a map of the surface geology of the study area.

Therefore the comparison of remote sensing data and field data has accomplished to the identification of the following surface geological formations:

- eolian sands medium to coarse;
- silty sands fine to medium (alluvial sand);
- limestone of plateau and reg;
- alluvial terraces;
- reddish sandstone;
- white gypsum sands;
- gypsum crusting;
- saline wet soils;
- non-soil surface (water surface and vegetation).

Keywords: Ouargla, remote sensing, soil, geology, geochemistry, surface formations.

References

- Busson, G., 1957-1965. Carte géologique du bassin Mésozoïque du Sahara Algéro-Tunisien au 1/2000.000 (J.).
- Girard, M.C., Girard, C.M., 2010. Traitement des données de télédétection, Dunod, Paris, 553p.
- Escadafal, R., 1989. Caractérisation de la surface des sols arides par observations de terrain et par télédétection. Applications : exemple de la région de Tataouine (Tunisie). Thèse Sci. Terre, Université Paris 6, éditions ORSTOM, Bondy, 317p.
- Hamdi-Aissa, B., Girard, M.C., 2000. Utilisation de la télédétection en régions sahariennes pour l'analyse et l'extrapolation spatiale des pédopaysages. *Science et changements planétaires/Sécheresse*, 11(3), 179-88.
- Hamdi-Aissa B., 2004. Soils and Brine Geochemistry and Mineralogy of Hyperarid Desert Playa, Ouargla Basin, Algerian Sahara. *Arid Land Research and Management*, 18, 103-126.