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Soil map of Khnifiss lagoon and GIS mapping of 2nd-order depressions in southwestern Morocco

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The geology and geomorphology of Moroccan Atlantic Sahara are dominated by a tabular coastal platform at altitudes of 30-35 m and a Hamada carbonate tableland with altitudes between 200 to 250 m. The coastal platform is marked by the presence of many depressions like sabkhas, lagoons while 2nd-order depressions (dayas) locally known as Grara dominate the tablelands. The studied region is situated in the Saharan bioclimatic level characterized by the scarcity of precipitation.

Khnifiss, the biggest lagoon in the Moroccan Atlantic coast is the most important wetland in the Atlantic Moroccan desert. Former studies focused on sedimentary, hydrology, pollution and ecology of the lagoon, but its soil has not been mapped. Here we map the subaqueous sediment and soils of the submerged area and the soil of its surrounding areas based on remote sensing completed by field work and laboratory analysis. The soil classification system is the French Référentiel Pédologique 2008 (RP 2008). We also present a landscape map, which constitutes the first step toward a soil map, and a regional soil map at the scale of 1:150,000. The soil map shows the dominance of weakly developed soils both in fluvio-marine and aeolian dominated environments.

We also present GIS- mapped shape, morphology, size and land use of about 300 2nd-order depressions in a defined 100 sq km of a carbonate plateau. The mapping identified different types of geomorphic, hydrological and agricultural activity that lead to different types of Graras. The total area occupied by Grara covers only 3.2% of the studied area.

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