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Modelling soil salinity in Oued El Abid watershed, Morocco

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Soil salinisation is a worldwide phenomenon considered to be a real threat to natural resources in arid and semi-arid climates. The phenomenon is controlled by soil (texture, depth, slope etc.), anthropogenic factors (drainage system, irrigation, crops types, etc.), and climate factors. The present study was conducted in the watershed of Oued El Abid in the upper part of Oum Er rbia watershed in the region of Beni Mellal-Khenifra, aimed at localising saline soil using remote sensing and a regression model. The spectral indices were extracted from Landsat imagery (30 m resolution). A linear correlation of electrical conductivity, which was calculated based on soil samples (ECs), and the values extracted based on spectral bands showed a high accuracy with an R2 (Root square) of 0.80. This study proposes a new spectral salinity index using Landsat bands B1 and B4. This hydro-chemical and statistical study, based on a yearlong survey, showed a moderate amount of salinity, which threatens the dam water quality. The results present an improved ability to use remote sensing and regression model integration to detect soil salinity with high accuracy and low cost, and permit the decision makers to make intervention at an early stage of soil salinisation.