

Geostatistical Models to Correct Salinity of Soils from Landsat Satellite Sensor: Application to the Oran Region, Algeria

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Abstract : The new approach of applied spatial geostatistics in materials sciences, agriculture accuracy, agricultural statistics, permitted an apprehension of managing and monitoring the water and groundwater qualities in a relationship with salt-affected soil. The anterior experiences concerning data acquisition, spatial-preparation studies on optical and multispectral data has facilitated the integration of correction models of electrical conductivity related with soils temperature (horizons of soils). For tomography apprehension, this physical parameter has been extracted from calibration of the thermal band (LANDSAT ETM+6) with a radiometric correction. Our study area is Oran region (Northern West of Algeria). Different spectral indices are determined such as salinity and sodicity index, the Combined Spectral Reflectance Index (CSRI), Normalized Difference Vegetation Index (NDVI), emissivity, Albedo, and Sodium Adsorption Ratio (SAR). The approach of geostatistical modeling of electrical conductivity (salinity), appears to be a useful decision support system for estimating corrected electrical resistivity related to the temperature of surface soils, according to the conversion models by substitution, the reference temperature at 25°C (where hydrochemical data are collected with this constraint). The Brightness temperatures extracted from satellite reflectance (LANDSAT ETM+) are used in consistency models to estimate electrical resistivity. The confusions that arise from the effects of salt stress and water stress removed followed by seasonal application of the geostatistical analysis in Geographic Information System (GIS) techniques investigation and monitoring the variation of the electrical conductivity in the alluvial aquifer of Es-Sénia for the salt-affected soil.

Keywords : geostatistical modelling, landsat, brightness temperature, conductivity

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020