

Abstract

Data acquired from the hyperspectral airborne sensor DAIS-7915 over Antequera in southern Spain was processed to yield a quantitative soil swelling potential map based on three physicochemical soil properties currently used in engineering as measures of soil swelling namely cation exchange capacity (CEC), coefficient of linear extensibility (COLE), and Saturated moisture content (SP). The method adopted was the use of the statistical procedures of cluster analysis and factor analysis to obtain spectral parameters with a potential to classify the soils into classes based on existing classification thresholds of the three properties where laboratory, field and image extracted pixel spectral data analysis were used. Applying this on a pixel-by-pixel basis revealed images that described spatially and qualitatively the surface distribution of these properties and thus swell potential differences among the soils in the area. The results gave an indication of the possible use of airborne spectral data for swell potential estimation.