ABSTRACT

There are many applications for remote sensing in science and engineering scopes, have been used these applications by employed remote sensing data (Landsat satellite) and topographic maps with scale (1:100000) Al-Hammar Marsh, south part of Iraq.

This work includes the digital image processing (image enhancement and the digital classification techniques) using ERDAS, ver.,8.7, package for Landsat 7 (ETM+), 3-visible bands with resolution (14.25m), acquired in March 2004 .

The field investigation includes GPS surveying, which coincides with the reports of the laboratory tests that may be divided into three groups of tests, physical tests, which include soil classification test (according to the unified soil classification system (USCS), for certain locations), chemical tests, which include organic matter, total dissolved solid, sulphate, and electrical conductivity, due to the effectiveness of these chemical properties on the spectral response of soil, and spectral measurements by using radiometer instrument.

The main results of this study show that the selected visible bands in the digital visual interpretation process are considered an optimum means to sense the soil types. It is found that the study region soil has high content of the fine soil texture (clay and silt). Therefore, the digital map of unsupervised classification gives good presentation of some of the main landcover classes and merges the others, whereas the supervised classification gives good presentation of the main landcover classes with overall accuracy equal to (99.7%).

On the other hand, by using GIS techniques depends on remote sensing data, using ArcView software ver.3.3, a geographical database and information about layers of soil of the overall studied area have been registered and constructed digitally to represent the geotechnical soil characteristics in associated files, and produce digital soil map. It is considered the preferable technique to represent the ground truth regarding the characteristics of soil, in comparison with the traditional method, because they are easy to produce, use, store and update, in addition they save in efforts, time and cost.