

## **THE POTENTIAL OF USING LANDSAT THEMATIC MAPPER DATA IN SOIL SURVEY STUDIES IN ARID REGIONS ( A CASE STUDY: SAUDI ARABIA)**

### **Abstract**

The primary objective of this study was to assess the potential of remote sensing data for mapping wide areas of different soil units within the arid environment. Landsat thematic mapper (TM) data were analyzed to determine how well they enable us to discriminate different soil units in Central Saudi Arabia (A1-Qasseem). Processing and analyzing the TM data indicated that maximum discrimination of all soil units in this study area is provided by the use of a Selective Principal Component transformation, with the use of such imagery up to 90% of the mapped soil units can be differentiated. This study shows that there is an agreement between soil maps made by traditional soil survey at regional and reconnaissance levels for certain areas and the Landsat TM image. This agreement may be due to a number of factors which include: 1) Scale similarity. 2) The studied soil profile is homogeneous throughout or derived from unique parent material. 3) The base map in traditional soil survey is derived from photo interpretation which considers the landforms as a base in discriminating various mapping units. In general, Landsat TM data can be regarded as an effective tool to be used as a base map for regional and reconnaissance soil survey.