Application of Remote Sensing and Geographic Information System Technologies in the Study of Yardangs of Lut Desert, Iran

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Key words:

ABSTRACT

Lut Desert Eastern Iran with an extent of about 80,000 square Kilometers includes a great diversity of hydroaeolian processes with a very striking pattern of landforms. Due to very poor or non- accessibility of some landforms in Lut Desert, it has not received much attention. To the authors knowledge not so many research was published about Lut Desert, specially no particular study was performed on Yardangs using Landsat satellite Thematic Mapper (TM) data. Yardang which is a wind abraded ridges of cohesive materials (Mc Cauley et al., 1976), is one of the most interesting geomorphological features in Deserts. Yardangs are parallel ridges of Lacustrine sediments between wind -scoured furrows aligned with the dominant wind. Deserts have experienced great temporal and spatial variability of these endogenetic process in Iran, the Lut Desert are apparently tectonically unstable area (Cooke et al., 1993). There have been several recent studies of Desert air/soil surface/rock temperatures (Alavi panah, 1997).

Thermal property of a material is representative of upper several centimeters of the surface. As in thermal remote sensing we measure the emitted radiation, it proves to be complementary to other remote sensing data and even unique in contributing the identification of surface materials and features such as geothermal anomalies, rock types, soil moisture etc. (Prakash. 2000). Thus, though still not fully explored, thermal remote sensing reserves potentials for a variety of applications. In general the 8 to 14 micro meter atmospheric window is utilized for the broad band thermal sensing. However in some space-borne thermal sensors, such as Landsat TM Band 6 operate in the wavelength range of 10.4 to 12.4 micro meter to avoid the ozone absorption peak which is located at 9.6 micrometer. In this study, to evaluate the capability of Landsat TM data in extracting some information on characteristics of Yardangs as on of the most striking erosion form in the world within western part of Lut Desert was selected.

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