

**UTILIZATION OF REMOTE SENSING TECHNIQUES FOR MAPPING THE
LISTWAENITE ASSOCIATED WITH JABAL AL-WASK OPHIOLITE COMPLEX,
NORTHWESTERN SAUDI ARABIA**

A. Madani, H. Harbi and A. Eldougoug

Department of Mineral Resources and Rocks, Faculty of Earth Sciences,
King Abdulaziz University. P.O. BOX 80206, Jeddah, 21589, Saudi Arabia

ABSTRACT

Jabal Al-Wask ophiolite complex is the largest ophiolitic ultramafic-mafic rock association in the Arabian Shield (50 X 25 Km) which has been tectonically emplaced over the volcano-sedimentary rocks of the Farri Group and overlain unconformably by Hadiyah Group volcano-sedimentary sequence. The serpentinites are hydrothermally altered to listwaenite along the tectonic contact with the volcano-sedimentary rocks. The main task of the present study is to utilize the Landsat ETM+ data for mapping the listwaenite exposures along the southern margin of Jabal Al-Wask serpentinites. Only serpentinites can be easily discriminated on the FCC principal components imagery in which they have sky blue image signature. On the 3/1 band ratio imagery listwaenite exposures have white image signature which may be due to the oxidation of magnesite and sulphides (the main constituents of listwaenite). Serpentinites and listwaenite have bright and dark grey image signatures respectively on 4/5 band ratio imagery. Absorption near band-4 leads to the lowering of 4/5 value and yields dark grey image signature to listwaenite. The false color composite ratio image 3/1:R, 4/5:G, 5/7:B was generated and merged with high spatial resolution panchromatic band 8 using Intensity, Hue & Saturation (IHS) transformation method. The resultant fused image proved to be useful in delineating the listwaenite occurrences and generating 1:50,000 geological image map for Jabal Al-Wask