Title: Application of remote sensing in soil mapping

Key words: Landsat 7ETM+, remote sensing, multispectral, hyperspectral, band ratios, iron oxides, clay minerals

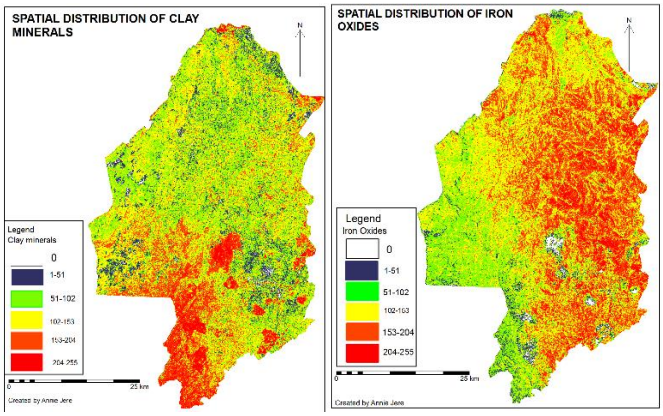
I. Abstract Body

The study aimed at assessing the application of remote sensing techniques, Landsat 7ETM+ in particular in detection of various elements found in soils. The study area is located in the Southern part of Malawi, Blantyre district. The data used in the study was downloaded at USGS and dated August 22, 1999 within the local drought season and after harvest. The dry season image was selected in order to minimize vegetation cover and soil moisture, and to maximize the exposure of bare soils.

Different multispectral and hyperspectral imagery have been used in classification of soil properties in many studies. Hyperspectral imagery is rather being considered as a more promising source of data to overcome the lack of soil information that often hamper soil mapping. However this study used multispectral imagery because of its availability.

Band ratios were used in the study to find the spatial distribution of iron oxides and clay minerals in the study area. The images produced from band ratios were stretched and density slicing was then applied to the stretched images to classify the images into digital thematic maps. The classification method used helped to delineate the spatial distribution of iron oxides and clay minerals concentrations in the study area. The results obtained in the study showed that iron oxides are considerably high while clay minerals are considerably low throughout the study area. The accuracy of the results was assessed by the existing soil and geological information of the study area, and other similar studies. The study revealed that remote sensing can successfully be applied in mapping soil properties of Malawi.

II. Image



III. Reference

1. Dill H.G., (2005), *A Lithofacies terrain model for the Blantyre Region: Implications for the Interpretation of Palaeosavanna Depositional Systems and for Environmental Geology and Economic Geology in Southern Malawi*; Journal of African Earthsciences 41, 341-393.
2. Jörg, P. Keller, A. Mulder, T. Schaepman, M.E. Wulf, H., (2015). *Remote Sensing of Soils*. Version, 5.2, Zurich, Switzland.

3. Morel S.W., (1958), *The geology of middle shire area*, Bull. Geol. Survey. Nyasaland, Number 10, government press, Zomba, Malawi.
4. Sarajlic S., (2012), *Land Cover Change and Mineral Composite Assessment of Tushka Depression, in Egypt, Using Remote Sensing and GIS*, (Reserrch paper, Georgia State University).

IV. Biography

Annie Jere is Staff Associate in Petroleum Geology working in the Mining Engineering Department at the University of Malawi, The Polytechnic. She is a holder of Bachelor of Science degree majoring in geology obtained at the University of Malawi, Chancellor College (2017). Prior to working at The Polytechnic, she worked as Junior Geologist at Akatswiri Mineral Resources, a firm based in Zomba district. Whilst doing her undergraduate studies, she was a member of e-Communication research group and she was highly involved in a research; Television White Space Technology. She is interested in the use of advanced technology in research.

Author details



Full name: Annie Slyverio Jere
Contact number: +265 998078286
Twitter account: @annie_jere (jere.annie@gmail.com)
Linked In account: Annie Jere (jere.annie@gmail.com)
Session name/number: Environmental Science
Category: Oral Presentation
Passport number: MA443025