

Jordan University of Science and Technology

Spatial evaluation of radionuclide concentrations and the associated radiation hazards using the Kriging method

Authors: Khaled F. Al-Shboul, Abdullah E. Alali, Alham W. Al-Shurafat, Ayman A. Arrasheed, Shamekh A. Al-Shboul

Abstract: Spatial variations of natural and artificial radiation hazards are evaluated by combining high-resolution gamma spectrometry with the Kriging method. The coupling of both methods was applied on radionuclides concentration measurements of northern Jordan soil, and the generated smooth surfaces had mean standardized error and root mean square standardized error values ranging from 6.9×10^{-3} to 26.9×10^{-3} and from 0.89 to 1.19, respectively. The spatial assessment shows that some radiation hazard indices are higher than the global average values. The produced maps show that the observed increase in uranium and thorium concentrations could be related to the spread of phosphate-rich rock compositions.