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Integration of remote sensing and geophysical applications for delineation of geological structures: Implication for water resources in Egypt

Lamees Mohamed and **Ahmed Fekri**
Mansoura University, Egypt

Saint Katherine area is located in southern Sinai including parallel ridges separated by deep wadis which have been cut along faults and fractures and enlarged through intense precipitation events during the old pluvial periods. The groundwater recharge find a way through interconnected joints to feed the existing wells in the low-lying fault zones. After the St. Katherine Protectorate was activated in 1996, public awareness of the possible harmful impact of the existing inadequate sewage disposal increased. The groundwater contamination (nitrates and coliform bacteria) in St. Katherine area causes health problems such as diarrhea and skin infections due to the use of well water for household purposes. This study will focus on; monitoring, evaluating and cleaning up the contaminant distribution in St. Katherine groundwater, using a conceptual model for the fault control on the groundwater flow in fractured basement aquifers to understand the possible pathways for the contaminated groundwater (using remote sensing data), and by preparing disinfectant tracers. It is known that Coliform bacteria could be treated by using Sulfanilamide drug, but in this study we will modify the Sulfanilamide compounds which are considered as ligands containing N, O, S donor atoms that could be used to uptake the transition metals, and produce a colored complex. The produced complex will work as a tracer to follow and understand the water path and disinfect water from Coliform bacteria. Moreover, such ligands could be loaded over natural polymeric material or algae to remove nitrates by reducing it into its elemental state of N2.

lamees.mohamed1@gmail.com