Contribution of hydromorphometric watershed modeling in assessment the flooding potentialities of Wadi Fierran basin, Southern Sinai

Badr M. Mabrouk¹, Hossam H. Elewa², Ahmed M. Nosair¹

¹Department of Geology, Faculty of Science, Zagazig University, Egypt.
²Department of Water Resources, National Authority for Remote Sensing & Space Sciences (NARSS), Egypt.

Abstract
Water resources management in Sinai Peninsula is vital needed goal for the different developmental activities. A detailed hydro-morphometric analysis for Wadi Fierran basin in Southern Sinai was introduced through the present work to throw lights on new potential or priority areas suitable for the water holding capacity which will have its own bearing on the groundwater recharge. The sub-watersheds' boundaries and hydro-morphometric parameters were delineated using the the ASTER DEM and Spot-4 satellite image mosaic by the WMS 8.0° Software. Subsequently, six thematic layers were used to construct a multi-parametric weighted spatial probability model (WSPM) by the ArcGIS 10.2° software. They are represented by the bifurcation ratio (Rb), drainage density (Dd), drainage texture (Dt), stream frequency (Fs), length of overland flow (Lg) and basin infiltration number (If). The resulted prioritization map classified W. Fierran into four priority classes ranging from the poor to very high for the water holding capacity. Accordingly, El-Akhdar, El-Rahaba, El-Shiekh, Solaf, Nesiene, sub-watersheds were categorized as high to very high in water holding capacity, because they have low to moderate values of Dd and high Rb, moderate values of Lg, low values of If and very low values of Fs. The high and very high priority classes in these sub-watersheds
occupy most of W. Fierran, which constitute about 72% of its total area.