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Developing a geological 3D model for the Tanour and Rasoun spring catchment area using ArcGIS and GOCAD

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Tanour and Rasoun karst springs (around 75 km northwest of the capital city of Amman in Jordan) are used as main local water supply for the surrounding villages. Carbonate rocks are the predominant rock type in the study area (Upper Cretaceous age). The karstification degree is moderate to high, with the availability of different karst features like dolines, caves, dry valleys, and highly fractured rocks. During the last years, the water supply from these springs had to be disconnected for several times due to microbial contamination and waste water pollution from local olive oil mills.

For better understanding of the geological and the hydrogeological setting of the study area, in addition to the delineation of the groundwater catchment area for Tanour and Rasoun springs, a geological 3D model of the main geological formations within the study area was established using ArcGIS and GOCAD. The model is based on geological maps and well data; it was established for seven geological layers that act as prominent aquifers and aquicludes. ArcGIS software was used for data preparation, processing and interpolation of varying thickness, while GOCAD used for geometrical modeling steps.

After the completion of the first modeling steps, major faults are included. Then the subsurface catchments will be delineated and compared with the superficial watersheds. The model still under development and open for further development.