# Evaluation of GIS tools for DEM and Geophysical Data Analysis

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Exploration geology has always played an important role in the mining industry, as years pass on newer technology is introduced to increase the efficiency of the process. Before heavily investing into drilling boreholes it is best if the location with the highest potential is selected. This can be achieved by using all the information in a geographical information system (GIS) environment. This process uses the remotely sensed data like satellite imagery and geophysics (e.g. EM, gravity and magnetics) of a large area, and other surficial layers like Digital Elevation Models (DEM). Remote sensing data can be collected using drones or airplanes within short periods of time and at a fraction of the price of borehole drilling. Also, it is important that the professionals interpreting the data have a basic set of previously generated block models for some geological scenarios with surficial data to compare with. The current focus of this contribution is the use of GIS tools and 3D geological models to identify certain geological features that may be of use for the understanding of geophysical and DEM data. The project has two phases, first is using digital elevation models (DEM) we generated a number of calculated sub-products (e.g. slope, hill shades and river systems) that provide a better view of the geology of an area. River systems were generated using the slopes and finding the directions of flow, eventually getting the rivers where majority of the slopes lead to, creating a network of waterflow. The second part of the project consists on generating block models for some common geological scenarios and then computing the gravity and magnetic response of these. This was completed in the 3D block model software NODDY. This software package permits the calculation of a combination of geological processes such as faults, folds, intrusions and mineral deposits. By doing this we can generate examples of how the surficial data like magnetic and gravity would look like for each geological situation. This approach serves as a basic example for exploration companies and academics to understand the observed geophysical response of different geological features.