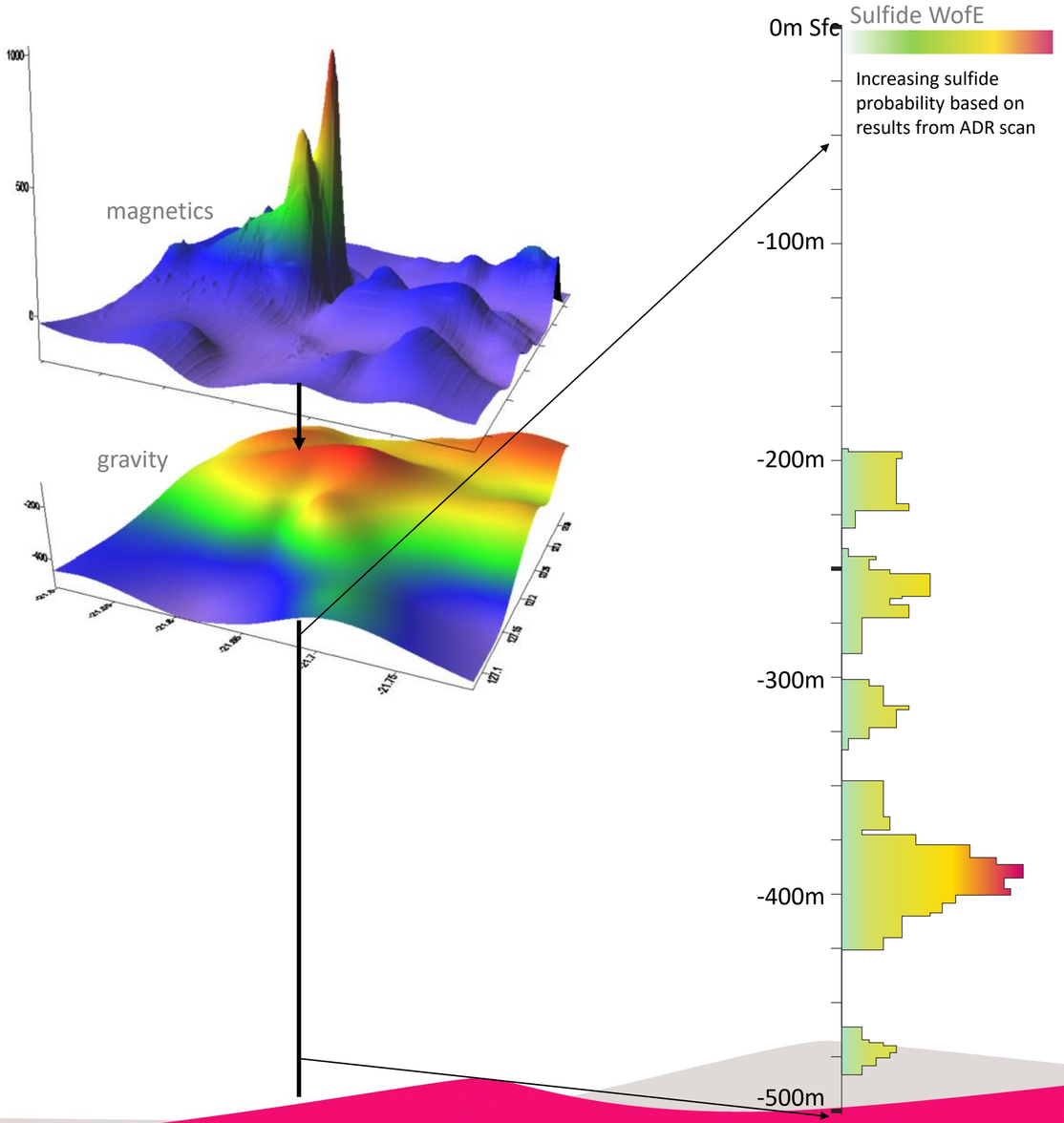
SULFIDE WEIGHTS OF EVIDENCE (WofE)



Adrok have been working on its library of measured geophysical properties of the rocks beneath the surface to develop a method of providing explorers wit the confidence to drill sulfide targets at depth. This extensive library includes orebodies of different types and from around the world

Working with several clients we have been able to obtain drill hole data to match the geophysical results. Explained in detail overleaf, we have established a 3- and 8-component set of Energy (E) and Frequency (F) harmonics results.

The technique will augment existing geophysical targets (*such as gravity and magnetics shown to the left*) definition but can be used prior to drilling to give increased confidence and decreased risk.

Provided overleaf is an explanation of the Weights of Evidence (WofE) method we are continuing to develop and fine tune.

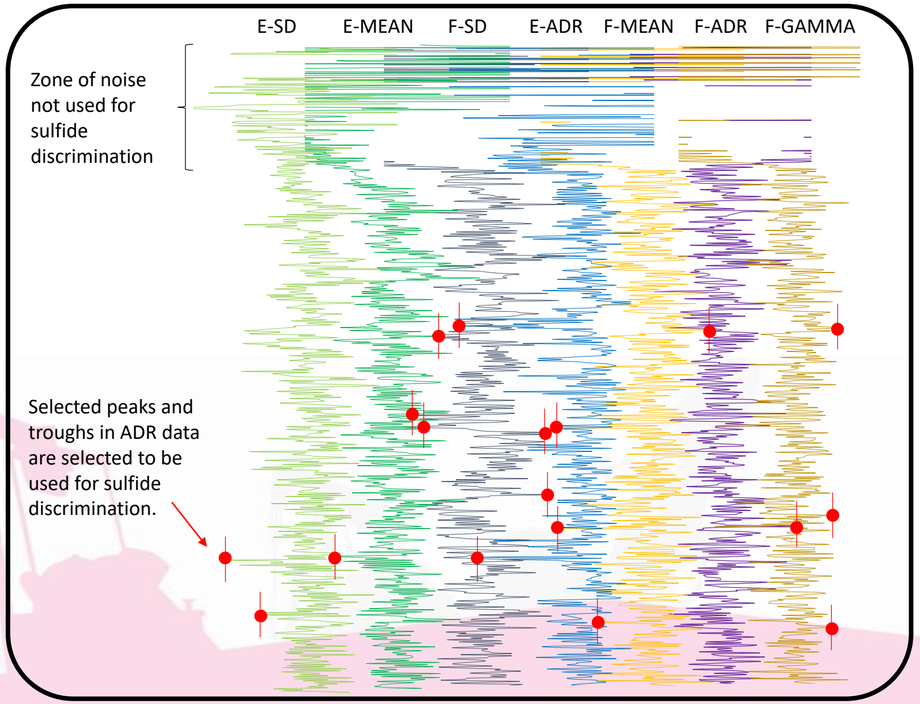
SULFIDE WEIGHTS OF EVIDENCE (WofE)

1. Adrok collects data in the field in the form of linear scans from the surface but profile scans can also be carried out if required. Data is plotted relative to depth (Y-axis).

2. The return signal is processed, and the different geophysical responses plotted relative to depth (shown below for seven (7) results only).

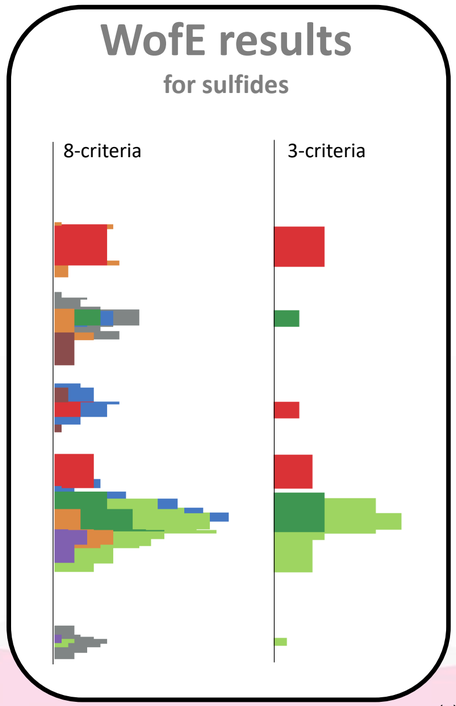
3. The resulting signal is characterised by highs and lows that correspond with changes in the geophysical properties of the rocks beneath the surface. After carrying many projects where sulfides are found in the rocks, Adrok has found that, not surprisingly, certain highs and lows in the different sets of results seem only to be characteristic of the results returned from sulfides.

4. When the results are stacked, these characteristic highs and lows can be extracted at their respective depths. Adrok can use up to 9 different results sets but has found either 8-criteria or 3-critiera best highlight the sulfides. Shown below are results for 7 criteria and some examples of points (highs and lows) that might be used to differentiate sulfides. This is an example only.



5. Each of the points selected in the results graphs are given a value based on their relative importance. We refer to this as Weights of Evidence (WofE) based on the similar technique used for spatial weighting of evidential layers. Each point is given a depth-of-influence in addition to a value.

6. The weighted results from steps 1-4 are combined into a single chart by "stacking" data to provide a depth-dependent total value of the WofE for that scan using 3-8 sets of criteria or layers of evidence.



7. The WofE results can be combined with other ADR-derived datasets including the % return energy (E% (log)) which is shown below (7). The peak in return energy is proportional to the reflectivity of the boundary between rock types. The reflectivity is dependent upon the different relative dielectric permittivity (ε_r) of the rocks on either side of the contact. Igneous, metamorphic and sedimentary rocks have ε_r of less than 15 but rarely above 10 and averaging around 5-6. Sulfides, however, have ε_r of >30 so the contact between massive sulfides and country rocks tends to give a strong reflection of energy.

8. Adrok can also process for correlation at different frequencies. Shown here is the correlation chart for 12-13MHz for the same scan as the WofE result.