

MINERAL PROSPECTING USING GIS



Kenex is a company that provides targeting, management and GIS (Geographic Information Systems) services for the mineral exploration, renewable energy and environmental industries. Adopting the latest GIS technologies, Kenex have undertaken predictive modelling to identify prospective areas for potential mineral deposits.

Kenex's area of expertise is at the knowledge end of the "Information Value Chain". We make the connection between data, information, processes and the ideas of people, to deliver innovative knowledge-based business solutions. We use predictive modelling techniques to ascertain the highest quality sites for mineral exploration.



"Spatial data modelling allows large scale analysis of data for scoping studies"

BENEFITS

Our modelling is one of the most advanced exploration targeting tools in the industry because:

- It allows an explorer to combine spatial data and knowledge in a way to manage and **target more effectively**.
- Modelling can be a **non-bias view of data** which is an important process in moving forward and away from preconceptions.
- Takes advantage of the wealth of digital data available in the industry and deals with **data overload issues** that plague many explorers.
- **Save time and Money** by putting resources into the most likely places first time and undertake **value/risk assessment** of assets.

MINERAL PROSPECTIVITY MODELLING

Mineral prospectivity modelling is about making intelligent exploration decisions based on the wealth of spatial data available to explorers and finding new mineral deposits using exploration models. Prospectivity modelling allows you to statistically assess the potential for a mineral deposit based on geology, geochemistry, and geophysics.

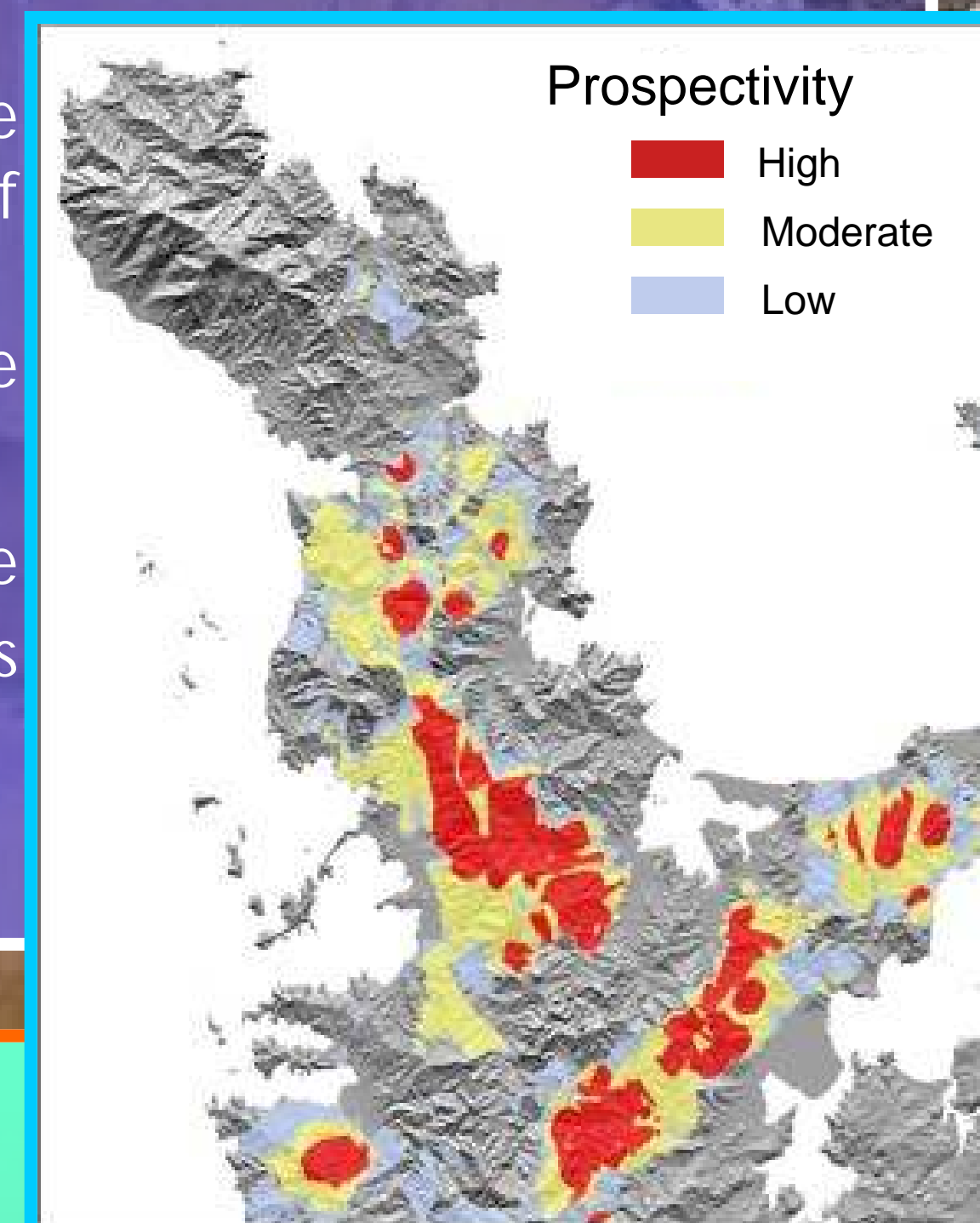
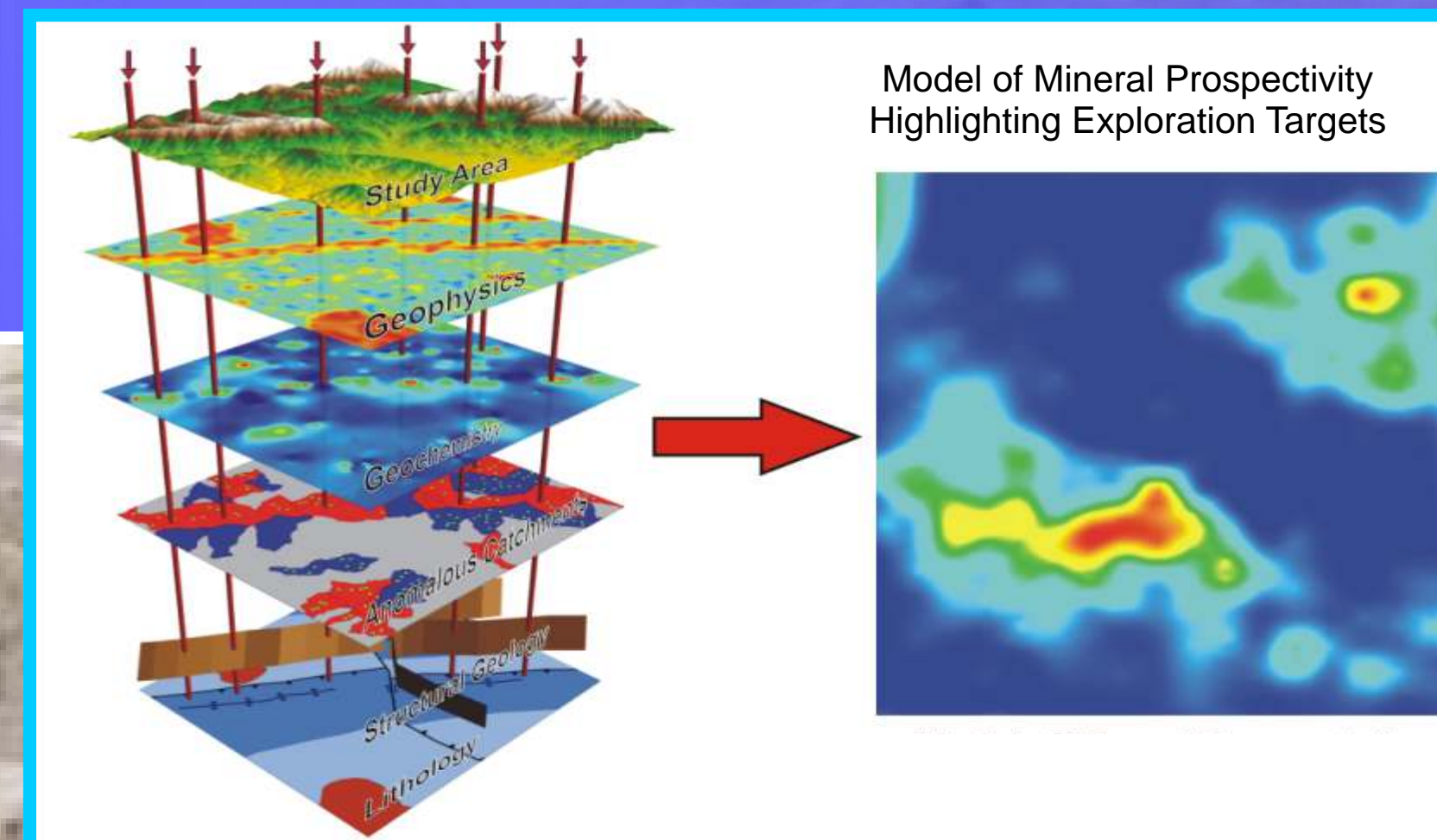
Prospectivity modelling produces a map showing those areas that are most likely to contain economic concentrations of the metal or mineral you're exploring for.

SPATIAL MODELLING

The probability of a deposit occurring in a particular theme can be applied to each variable by using a subjective expert opinion (Fuzzy Logic) or using a more objective statistically calculated value by using the Weights of Evidence statistical technique.

When all the data variables have had probabilities assigned to them they are combined into one map (see illustration below) using the probabilities to weight the relative importance of the variables.

Spatial data modelling is one of the best techniques to assess the mineral prospectivity of land as it allows the combination of all the important predictive variables related to your mineral deposit model into one map.



Spatial Modelling Techniques

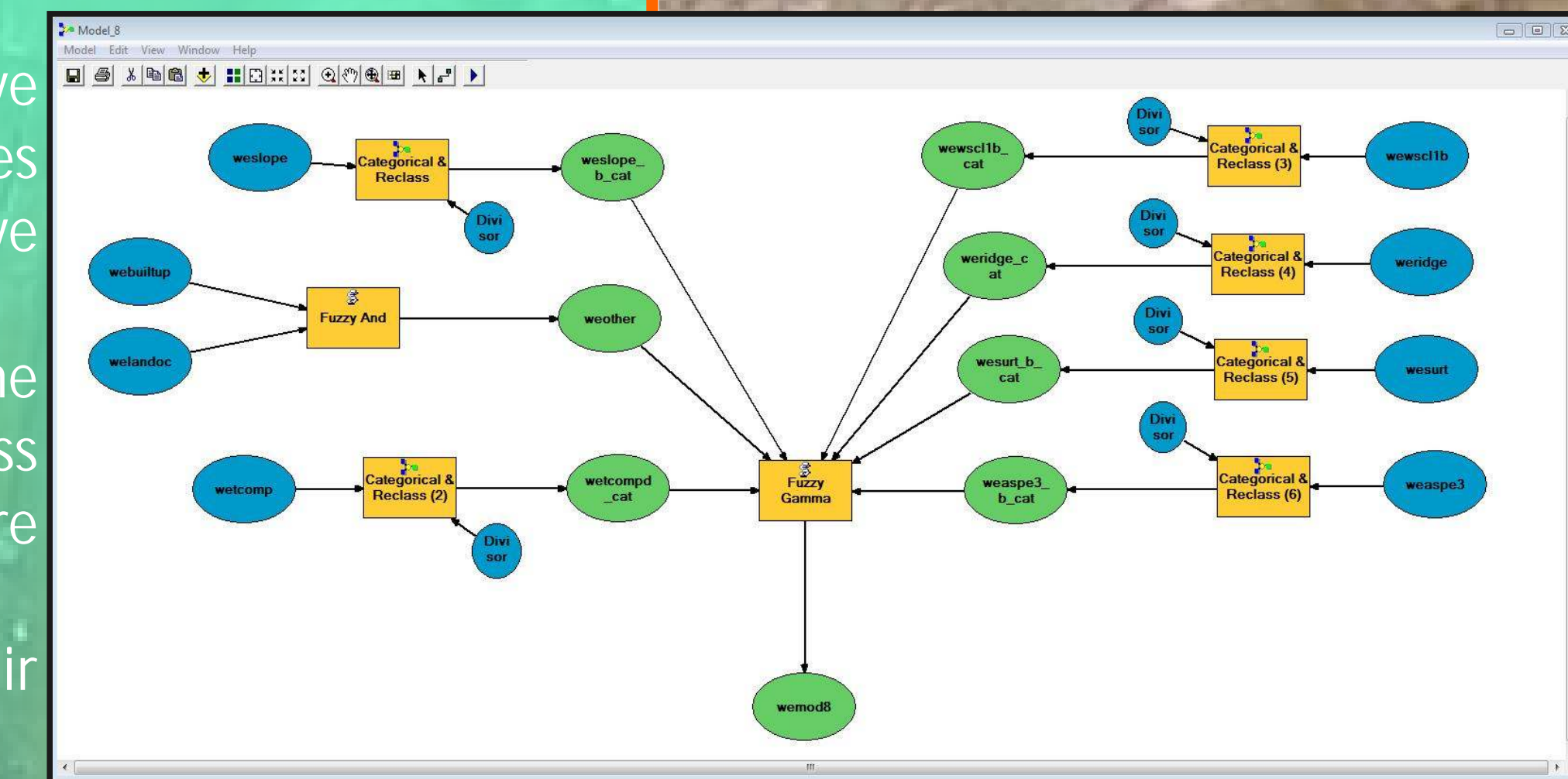
The simplest type of predictive spatial analysis is where maps, with the chosen input variable(s) represented by a series of integer values, are combined together using arithmetic operators. This type of analysis takes no account of the relative importance of the variables being used and is based on expert opinion.

Fuzzy Logic techniques address the problem of the relative importance of data being used, but this technique still relies on expert opinion to derive weights that rank the relative importance of the variable for the map combination.

Weights of Evidence, in contrast uses statistical analysis of the map layers being used with a training dataset to make less subjective decisions on how the map layers in any model are combined.

More details of the particular techniques and their application are given in our website:

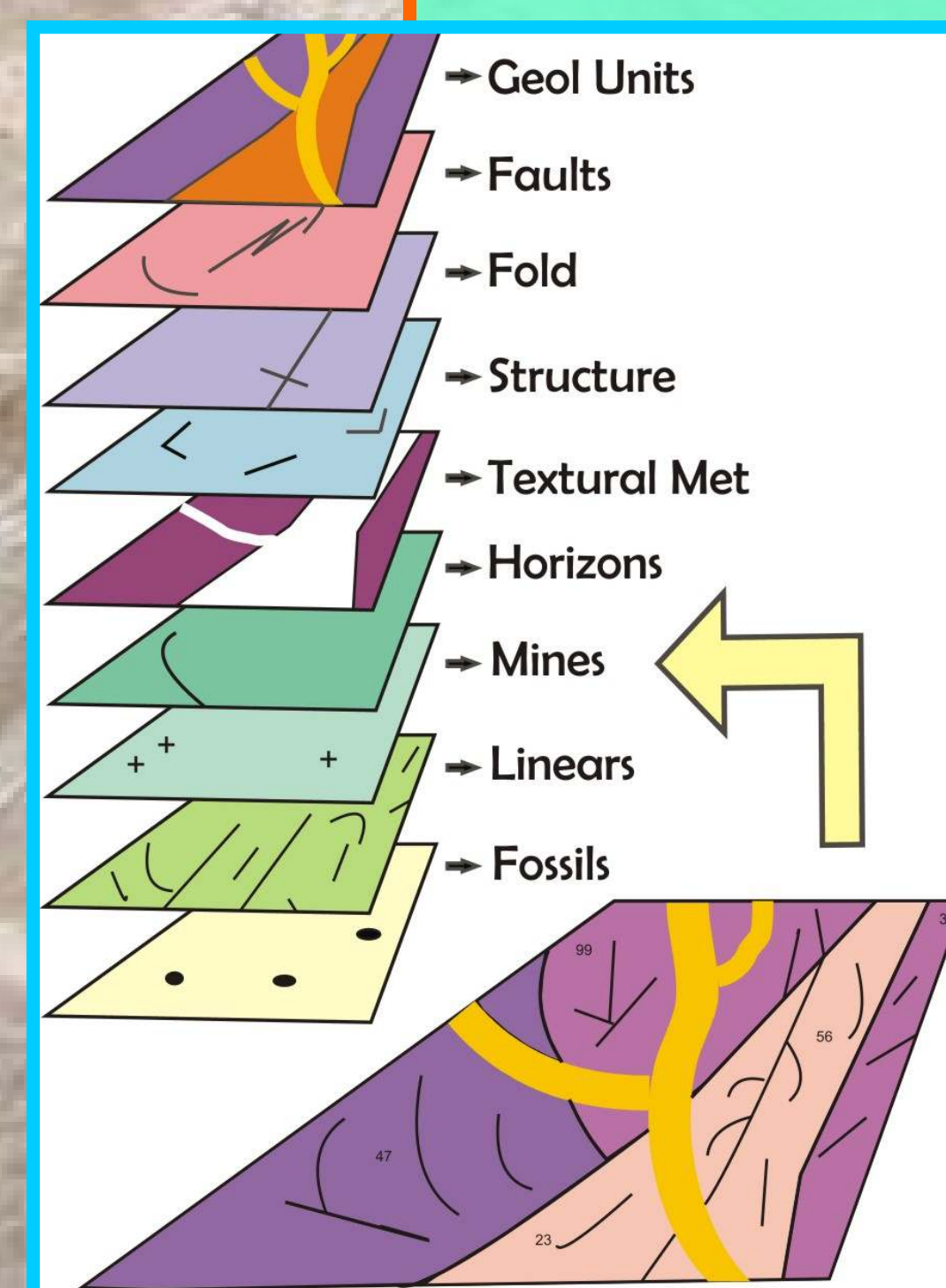
<http://kenex.co.nz/Predictive>



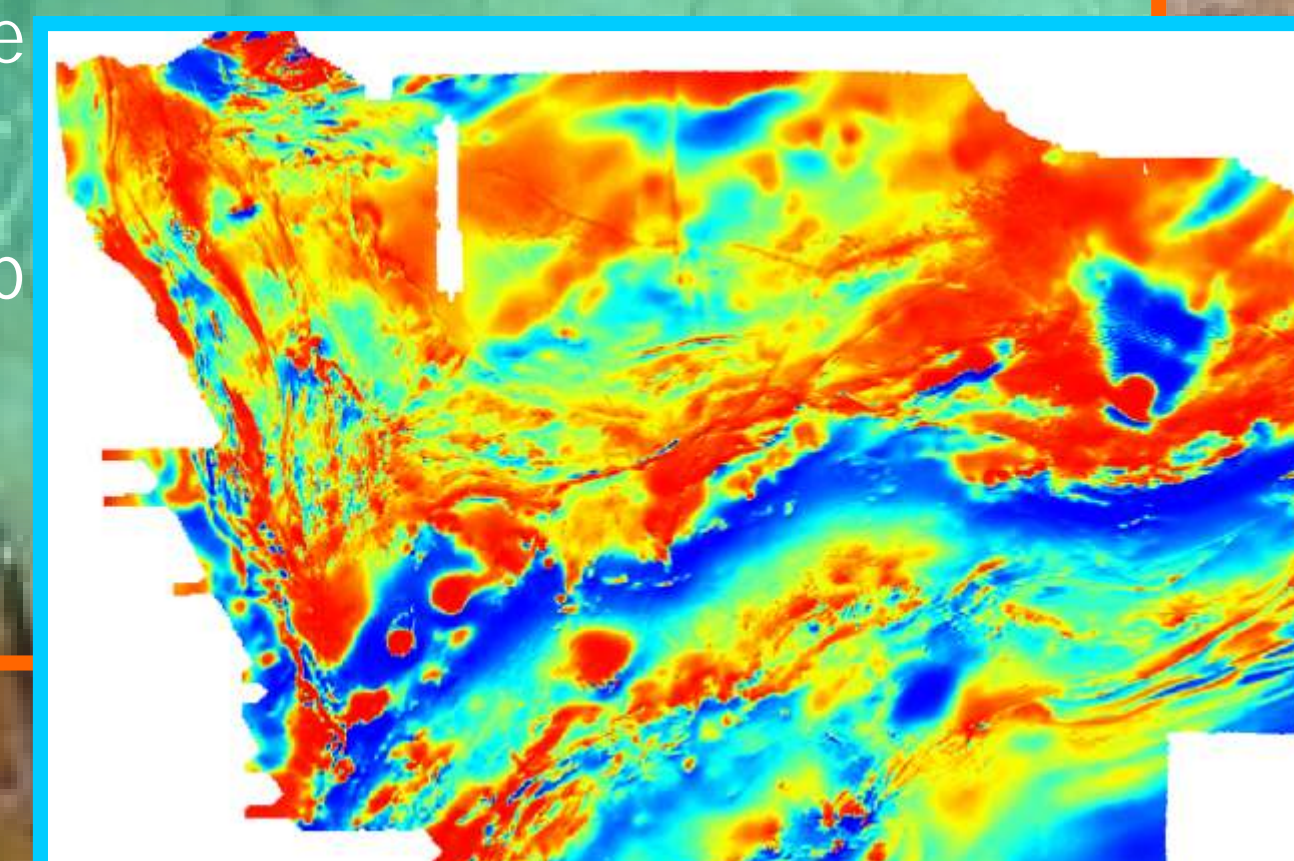
What goes into a prospectivity model?

Although the recipe for the formation of an ore body can be simplified to geology, geochemistry, and geophysics the combination of predictive variables that can be created from these base data are many and varied.

map the key processes in a mineral system and can be recovered from data



ces
have to have some relationship to the
ned the ore deposit in question.
es may be extracted from a geological map
ustration on the left).



EXAMPLES

Kenex has completed numerous mineral prospectivity models for a variety of mineral commodities in a range of geological and geographical settings. A sample of models completed includes:

- Porphyry Cu-Au Mineralisation in Papua New Guinea
- Epithermal Au-Ag Mineralisation in New Zealand, Turkey and Papua New Guinea
- Volcanogenic Massive Sulphide Cu-Au in Oman
- Granite related nickel skarn mineralisation in Australia
- Iron Oxide Copper Gold mineralisation in Finland, Namibia, Zambia and Australia (Northern Territory)
- Granite related gold mineralisation in Australia and New Zealand
- Mesothermal gold mineralisation in New Zealand
- Further details of some of our successful projects can be located on our website:

<http://kenex.co.nz/Predictive/Successes>

