

## From geological data and historical scenarios to conceptual models

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Regardless of the purposes they deserve or how they are built, geological models often rely on a single geological interpretation. However, were we to ask for a geological interpretation from a hundred different geologists, we would get a hundred different geological interpretations. To minimize the risk of biased and over-confident predictions, modellers need to consider an ensemble of plausible geological interpretations or conceptual models.

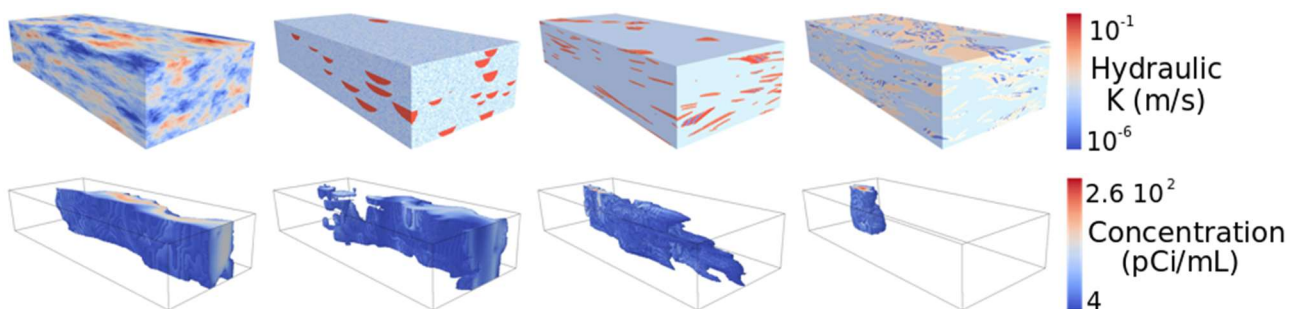


Figure 1. Influence of different geological conceptual models for aquifers (top row) on contaminated plume predictions (bottom row); the mean and variance of the log hydraulic conductivity are constant, but the geometries radically different (courtesy from [1]).

Here, we consider geological data from the Yalgoo-Singleton area and various geological history scenarios to define several plausible conceptual models. The historical scenarios are defined as the product of expert knowledge and combinatorial exploration of geological events. The resulting conceptual models are compared in terms of topology, connectivity and geostatistics.

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### References

Pirot, G., P. Renard, E. Huber, J. Straubhaar, and P. Huggenberger, 2015, Influence of conceptual model uncertainty on contaminant transport forecasting in braided river aquifers: *Journal of hydrology*, 531, 124-141.