



## **Spatial Heterogeneity of Carbonates: genetic approach**

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Homogeneous equivalent property is a classical concept used in hydrogeology to define heterogeneity of hydraulic properties. Known as averaging, it tries to describe the spatial variability of the rock properties from geologic observations and local measurements. The techniques available for these descriptions are mostly continuous Geostatistical models, or discontinuous facies models such as the Boolean, Indicator or Gaussian-Threshold models and the Markov chain model. These facies models are better suited to treating issues of rock strata connectivity, e.g. buried high permeability channels or low permeability barriers, which greatly affect flow and, above all, transport in aquifers. Genetic models provide new ways to incorporate more geology into the facies description, an approach that has been well developed in the oil industry, but not enough in hydrogeology. Here we present how a 3Dbasin model, based on a detailed stratigraphic data base, has been used in a genetic way to reproduce the permeability and storage coefficient heterogeneities at the regional scale.