The role of sedimentology and sequence stratigraphy in the stochastic modeling of a carbonate reservoir

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In the late 90's progressive exploration and production companies are embracing new technologies including computer software in order to help them better understand reservoir architecture and to develop the resources contained in these reservoirs.

Roxar as a major supplier of geological modeling software via its IRAP RMS 3D geological modeling package often sees 3D geological models being constructed with little real geological data. Any geological model be it deterministically or stochastically derived must have good basic geological data to condition it. The old adage "garbage in garbage out" is very relevant to 3D geological modeling.

Carbonate models on the whole require a greater geological understanding than clastic models and are often over simplified. An E&P company collects millions of dollars worth of geophysical, geological and engineering data during appraisal drilling. The consequences of not coupling this data with an understanding of the sedimentology and sequence stratigraphy prior to model building will result in a flawed 3D stochastic reservoir model being generated. This translates into frustration with the software, and wasted man-hours and dollars.

Achieving a good understanding of sedimentology and sequence stratigraphy will enable the modeling of facies and petrophysical attributes to be done in a consistent manner, therefore resulting in accurate facies patterns both spatially and in depth.

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