

Constructing Models for Understanding or With Understanding?

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ABSTRACT

Technology and computing power have dramatically increased during the last 2 decades. The oil and gas industry has embraced such techniques aiming for an ever increasing resolution and detail in subsurface models used to justify multi-million dollars decisions.

However, subsurface data is, to this date, indirect, scarce and often biased; therefore it requires interpretation, which needs to be based on solid geological knowledge and fair amounts of engineering judgment, and not solely driven by mathematical algorithms.

Subsurface models remain today a crude rudimentary approximation of our understanding of reality. But models are useful tools: for computing, communication and simulation of scenarios; they are particularly valuable to check consequences of “our” decisions within an “uncertain” environment.

The oil business has also evolved. We are nowadays targeting increasingly challenging reservoirs, tighter rocks, thinner columns, challenging settings, with progressively more ambitious techniques for economic maximum recovery. Well established modeling assumptions and simplifications that are useful for either analytical workflows or uncomplicated fields, are not directly transportable to 3D modeling of complex settings and recovery mechanisms.

Complexity of workflows or computational power is not a guaranty for finding adequate solutions. Complex problems usually require expert thinking to be conveyed into simple solutions. Contemplating multi-scenarios to encompass the unknown is paramount; conceptual models about reservoir plumbing and fluid fluxes can anticipate risks and opportunities from data clues and smart use of analogues. Choosing the appropriate workflows for your specific geological setting, your identified challenges and the explicit decisions to be taken is vital to ensure useful modeling efforts.