Shaping the Future of Fluvial Reservoir Modeling

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River deposits are commonly represented by reservoir modeling software as ribbons of sand (the channels) encased in a mud background (the floodplain). The reality, however, is that the fluvial rock record is a much more disorganized mosaic, built from partially eroded remnants of the genetic elements of active rivers. Channel belts do tend to a more ribbon-like plan, but contain a great deal of internal complexity that can make the overall belt morphology irrelevant to the modeling. To be captured successfully in models, this character requires a different approach. The use of ellipsoids of irregular size and shape populated has been advocated. Perhaps better still, though potentially heretical, is abandoning object modeling completely.

This is not a new story. Others have told some or all of it before. Yet the messages are still not being accepted and acted upon. Why is this? Where is training going wrong and what can be done to improve matters?

Perhaps one of the main reasons for these misconceptions is that, ironically, rivers are too familiar: we have all seen them and think we know what they look like. The main geomorphic elements are taught to us at school. Aerial and satellite images are freely available at the click of a mouse. But the modern-day plan view of rivers is a misleading guide to the ultimate sedimentary record left behind. It is a momentary snapshot in time that is lacking crucial information on temporal relationships and preservation potential. The majority of sedimentology text books perpetuate the problem because they portray inappropriately short reaches of river with misleadingly small floodplains set within over-simplified river classifications that incorrectly predict the spatial arrangement of the sedimentary facies. 3D seismic timeslices have been claimed as a panacea, but too often they are interpreted without adequate lithological calibration or consideration of spatial resolution, and are available only for a tiny minority of reservoirs.

We require new conceptual models for the preserved deposits of rivers, and we must detach ourselves from the presumption that the present (*behavior of a river*) is the key to the (*record of its*) past. The best, fit-for-purpose, fluvial reservoir model may be the one built by the person with no knowledge of river sediments, because they will seek to represent in the model only what is actually in the subsurface, not what they expect to be there.