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**Building Reservoir Model Using Virtual Outcrops: A Fully Quantitative Approach**

Analogue outcrops improve geological interpretation by revealing important detailed sedimentary architectural elements at sub-seismic resolutions that strongly control fluid flow. Furthermore, they can be used as a framework for upscaling petrophysical parameters from bed-scale to reservoir scale. However, geologic modelling and fluid-flow simulation are quantitative and 3-D, while conventional outcrop data are mainly qualitative and 1D or 2-D and therefore in a wrong format to yield greatest gains for reservoir modelling. As computers are now central to our work process, outcrop field data must be transferred onto the computer platform.

Outcrops of the Eocene Ainsa-II turbidite system, South-Pyrenean Foreland Basin (Spain), have been digitally sampled to make high-accuracy photo-realistic virtual outcrops. The sampling involves Real Time Kinematic GPS surveying and reflectorless laser range finders that combined can produce globally positioned three-dimensional outcrop surfaces. Further, digital photographs of the outcrops are accurately positioned and draped onto the surfaces to produce photo-realistic virtual outcrops.

The virtual outcrops are displayed in an immersive 3-D visualization room (CAVE) where stratigraphic surfaces and architectural elements are digitised. These surfaces together with facies and stratigraphic data from globally positioned drill-cores and measured sedimentologic sections, basin-wide mapped structural surfaces, and petrophysical data from analogue producing fields have been used to build a 3-D reservoir model of the Ainsa-II turbidite system. This process of collecting 3-D digital data and interpreting them in a 3-D environment greatly expedites the creation of an accurate, quantitative outcrop analogue model and is likely to be a template for future data collection efforts.