

Conceptual Models Based on Outcrop Analogy: The Evolution and Impact of New Technologies

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ABSTRACT

The contribution of stratigraphy to the knowledge of reservoirs and their boundary limits (permeability barriers) is seen in the evolution of methodology from the classical stratigraphic field log (1D) to current three-dimensional models. These incorporate cross sections and stratigraphic schemes (2d) made from short distance surface outcrop studies and often include electric well logs and then reach the stage of facies maps made from an HD aerial photomontage. The latter has the advantage of recording lateral facies changes more accurately and incorporating provision for the collection of samples for various studies (petrographic, petrophysical, geochemical, geomechanical, paleontological, chemo- stratigraphic, diagenetic, etc). The possibility of measuring multispectral gamma rays, magnetic susceptibility, and spectral reflectance from field profiles greatly facilitates correlations and reduces the influence of the interpreter's pre-conceived default model.

With respect to the distribution, orientation, size, and sequence of material measured from fractures in outcrops, the procedure begins with classical measuring stations by area or lines, and then incorporates Lidar images and the semi-automatic mapping of fractures. This technique also is useful in the characterization of facies at outcrop level and mapping them. This procedure, albeit more expensive, reduces time and provides a large quantity of important information.

This session will address the issue of conceptual models and their contribution to reservoir knowledge as well as their dynamic evolution and continual updating. The new technology's primary impact involves adding more and more variables to the model, more and more data, and more and more questions to answer. The interpreter must be increasingly prepared to understand the data sets that become available.

Examples from some of the main facies of the Lajas Formation will be presented with the boundary surfaces associated with the constitution of the unit being displayed. The outcrops are located mainly along the Huincul High, where the lateral variations of A / S and the influence of substrata with tectonics mobility can be seen, as evidenced by the presence of internal unconformities that are amplified toward the edge of basin.