

## **Digital Outcrop Models: A Tool for Reservoir Characterization and Teaching**

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### **Abstract**

Developing an accurate characterization of subsurface reservoir heterogeneity is a major challenge for all aspects of exploration and production, especially when dealing with carbonate reservoirs that typically display heterogeneity at a range of length scales. Digital outcrop models (DOM's) represent a relatively new tool for incorporating high resolution information on heterogeneity from outcrops into subsurface reservoir models; such models can provide details of reservoir heterogeneity at scales that are simply not available from subsurface datasets alone. In addition, these models can be used as a tool for the education of young professionals in industry.

A workflow has been developed (and has evolved through time) for the development and use of DOM's for reservoir characterization, and examples of this approach are highlighted in DOM's constructed from outcrops that are equivalent to the Permo-Triassic Khuff and the Jurassic Arab-D reservoirs in central Saudi Arabia. The specific objectives of each of these models has differed, but in all cases offers the advantage of improved reservoir modeling, flow unit definition, and scenario evaluation in hydrocarbon and aquifer systems.