Title: Characterisation and modelling of heterogeneity in thinly bedded, shallow-marine sandstone reservoirs

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Abstract

Wave-dominated shallow-marine sandstone reservoirs contain significant intervals of thinly bedded facies characterised by the presence of interbedded sandstones and shales. The thinly bedded facies contain gutter casts, which are sand-filled erosional scours formed by storm-generated flows. The gutter casts may increase connectivity between sandstone beds that are otherwise isolated by shales, thus creating effective vertical permeability. The 3D geometry and dimensions of gutter casts, and patterns in their spatial distribution are uncertain. These aspects of facies architecture and their impact on reservoir performance are being addressed using data from an outcrop analogue (‘G2” parasequence, Grassy Member, Blackhawk Formation, exposed in the Book Cliffs, Utah, USA). A 3D high-resolution digital outcrop models (DOM) of the outcrop analogue is being constructed using digital photogrammetry combined with sedimentary logs. This talk will focus on the workflow and techniques used to construct the DOM. Future analysis of sandstone beds in the DOM will constrain gutter cast geometry, extent, orientation and sandstone connectivity for subsequent reservoir modelling.

Biography

Godspower Onyenanu received a BSc (2009) with honours in Geology from Nnamdi-Azikiwe University Nigeria and an MSc (2013) in Petroleum Geoscience for Exploration from the University of Manchester, United Kingdom. He began his PhD in January 2015 at Imperial College, where his research involves evaluating uncertainty and characterising heterogeneity that affect flow distribution within the Novel Reservoir Modelling and Simulation group (NORMS).