



Cluster Analysis in Petrophysics for Unconventionals and its Influence on Volumetrics

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ABSTRACT

Using cluster analysis in petrophysics is not a new application, however with the recent push for Data Analytics and Big Data it is beginning to be used in petrophysical interpretations. In the past most of the cluster analysis applications were done for wireline log typing (electro-facies) to help with sampling or determining rock types in a petrophysical interpretation. The methods in this paper will go well beyond this and focus mostly on predicting volumetrics using cluster analysis and how it impacts ones in place calculations.

Typically, accuracy in volumetrics from petrophysical interpretations (i.e., porosity or saturation) are based on wells with robust log suites and core. These are not always available, and it is common for a petrophysicist to create a reduced petrophysical model for the best correlation to porosity. This process of reducing a model can often create uncertainties and lead to impactful decisions on new areas. This uncertainty can be reduced if one uses cluster analysis rather than the traditional reduced model. In this paper the use of cluster analysis severely alters the perception of in place calculations that will drastically impact decisions on spacing and recovery.