

## **Improved Reservoir Parameters Prediction from Seismic Attributes Using Multivariate Statistics and Neural Networks: A Niger Delta Case Study**

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Poststack seismic data and well logs from some part of Niger Delta Basin were analyzed with a view to predicting reservoir parameters from seismic attributes. Recently, this basin has assumed special importance due to major deepwater gas discoveries. To achieve this aim the objectives are to determine the petrophysical properties from borehole log measurements, define the boundaries of these sands, and predict the reservoir properties from seismic attributes so as to reduce the risk of finding productive sands. Multi-attribute regression analysis has been used to obtain the optimum ordering of the attributes and neural networks to increase the resolution of the final result. The attributes that were used included standard seismic attributes as well as attributes such as P- and S impedance from a simultaneous inversion. Gamma-ray, density, and density-porosity logs were used for the training. The results of the study show that the use of data cross-plots can enhance our ability to map the extent of our clean sand facies. Cross-plot of Lambda-Rho versus density-porosity with mu-rho as background color showed that it is a very good lithology discriminant. These, therefore, point to the possibility of defining clearly, the limits of the reservoirs using multivariate statistics and neural networks.