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Seismic Sedimentology and Analogue Depositional Models: a Quantitative Approach for Integration

The interpretation of seismic data aimed at lithological model building is a difficult task especially in frontier areas, where poor well information is normally available. The outcome of 3D seismic data volume interpretation largely relies on the goodness of the conceptual analogue geological model that the interpreter has in mind. In sedimentary basins the knowledge of the architecture of the depositional systems and the related depositional processes can provide important constraints when the correct system analogue is selected and used for prediction. In the last decade the study of the deep water turbidite systems of the West African Atlantic margin has faced the problem of having abundance of 3D seismic data but only very few wells available for calibration. Thus, the correct use of analogues, derived from outcrop experience or from modern systems (sea-floor data), has often been the key to success in exploration activity. The methodology presented here aims at integrating, in a numerical and quantitative way, the information coming from seismic data, borehole data and from the assumed a priori depositional models. The qualitative information of the selected analogue are transformed into numerical information (pseudo-well) and then integrated in a multi-attribute seismic inversion for a lithologic characterization of the target sequences.