Bioturbation Indexing: a Robust High Resolution Extraction Technique for Reservoir Characterization in Deltaic/Shallow Marine Palaeographic Setting

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Abstract

Bioturbation is defined as the reworking of soils and sediments by animals or plants. These include burrowing, ingestion, and defecation of sediment grains. The amount, type, and distribution of bioturbation provide information about depositional conditions. Because these annotations are extremely powerful tools that aid in reconstruction of conditions at and shortly after deposition. Various schemes have been widely used and described in the writings which talks about pale oceanographic and paleoclimatic studies and in research on relative sea-level change. The most interesting aspect of these to the oil and gas industry are associated with the changes brought about by the living organism which are active near the shallow water sediments in marginal marine to marine settings. Most of this activity are typically limited to few meters but encompass tens and thousand square kilometres of area. Various attempts have been made to classify bioturbation structures as per the need and purpose for which they have been employed (e.g., Reineck and Singh 1980). Present study focused on the technique on utilizing the high resolution microresistivity image textures. Bioturbation may appear on the image as conductive spots or patches. Technique utilizing a heterogeneities delineation process will quantify the “conductive percentage” on images. We also analysed another impact of various such intensity on the sorting of image fabric which in turn is the qualitative degree of connectivity between this spots or patches on the image. So, by using the cut-off based on the sorting and conductive proportion, we develop the Bioturbation Index which defines the intensity of bioturbation in reservoir sections. “Bioturbation index” extend immense assistance in identifying the stratigraphic variation of bioturbation intensity, a cyclicity of the bioturbation percentage can be determined with precise boundaries which lead to the inference related to the sea level oscillation which helps to build the detailed depositional sequences which is directly related to the reservoir quality. This workflow reduces the user dependency or subjectivity therefore leads to more consistent results across the field wide reservoir characterization.