Mud diapirs distribution and characteristics based on 3D seismic data, located at the Miranga Low, central sector of the Recôncavo Basin, state of Bahia, Brazil.

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Abstract

The Recôncavo Basin is located in the northeastern Brazil, state of Bahia, which presents diapiric mud features, especially in the Miranga Low, central sector of the basin. Mud and salt diapirs are somewhat comparable, however, they differ in physicochemical properties. In seismic images, the mud diapirs present chaotic reflectors at their interior and low amplitudes at their crest, due to the few lithological differences with the overlying layers; salt diapirs present high amplitude in its crest and distinct lateral limits due to great lithological differences with the overlying layers. The present work identified, classified and mapped the mud diapirs of the Polo Miranga seismic cube in the central sector of the Recôncavo Basin, characterizing and correlating them with regional structural features of the basin. Inlines, crosslines and time slices of the seismic cube were analyzed and interpreted, with the aid of the seismic attribute of similarity, and correlation with wells. Three mud diapirs were detected in the study area, labeled Apraius-Miranga Norte, Pedra do Salgado and Biriba. The Apraius-Miranga Norte and Pedra do Salgado diapirs show seismic evidence of reaching the relief surface. The Apraius-Miranga Norte diapir is aligned NW-SE, following the trend of the Itanagra-Araças Fault; the diapir of Biriba and Pedra do Salgado follow the N-S trend, with no preferential orientation by any of the faults of the region. Data suggest the possibility that a shale weld occurs in the Apraius-Miranga Norte diapir.