Geological and Geophysical Indicators of Methane Hydrates

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Methane hydrates are found worldwide and many studies have been carried out to develop an efficient method to identify them using various geological and geophysical anomalies. In order to study the tectono-sedimentry control on the likelihood of methane hydrate and to establish the geophysical and geological framework over the continental margins, an integrated approach is required.

This study reveals the synthesis of various geological and geophysical indicators which should be used for the identification of methane hydrates. Synthetic seismic response together with real data from different regions of the world reveals various geological and geophysical indicators of methane hydrates and associated free gas. The geological signatures such as, development of hydrate mounds, pockmark depressions, mud volcanism, fault structures and development of discrete fractures have been identified as prime indicators for the identification of methane hydrates. The geophysical indicators included bottom simulating reflector (BSR), double bottom simulating reflector (DBSR), enhanced seismic reflection below the BSR and seismic chimneys (Figure 1).

Keywords: Methane Hydrate, BSR, DBSR, GHSZ, Seismic chimneys

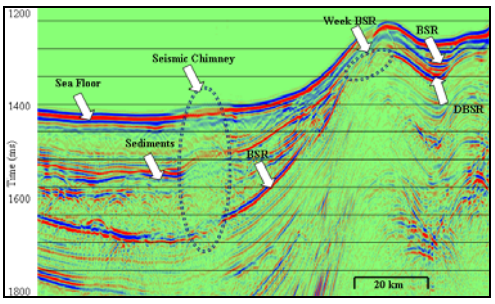

Figure 1. Post Stack Time Migrated section from Green Canyon, Offshore USA. Various geophysical indicators are marked.

References

[1] Che-Chuan Lin et al., (2009) Geological controls on BSR occurrences in the incipient arc-continent collision zone off southwest Taiwan. Marine and Petroleum Geology, 26 (7), pp. 1118-1131.