

Abstract for an Oral Presentation, “Direct seismic indicators of gas hydrates in the Walker Ridge and Green Canyon areas, deepwater Gulf of Mexico”,
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This paper presents seismic evidence for the presence of free gas, gas hydrates, and bottom simulating reflectors (BSRs) in the sedimentary mini-basins of the Green Canyon (GC) and the Walker Ridge (WR) protraction areas in the deepwater Gulf of Mexico. BSRs correspond to the base of the gas-hydrate stability zone (BHSZ). The BSRs result from an acoustic impedance contrast between hydrate-cemented sediments within the GHSZ and free gas trapped in the sediments beneath the BHSZ (Shipley et al, AAPG Bulletin, 63, 2204-2213, 1979). BSRs observed on pre-stack time/depth-migrated 2D and 3D reflection seismic data are interpreted to be underlain by free gas, indicated by both the high negative seismic amplitudes and the overlying blanking zones. In this study area there is no direct one-to-one relationship between gas hydrate concentration, strong BSRs, and amplitude blanking. Since this paper was published in 2007, over a hundred BSRs have been interpreted in the deepwater of Gulf of Mexico as three different classes - continuous, discontinuous and pluming (Shedd et al, FITI, 2009). The MMS published the “Preliminary Evaluation of In-Place Gas Hydrate Resources: Gulf of Mexico Outer Continental Shelf” (Frye et al, MMS public website, OCS Report MMS 2008-004) based on geological and geophysical mapping, and stochastic modeling. In April and May of 2009, DOE - Chevron Joint Industry Project (JIP) Leg II drilled above BSRs at Alaminos Canyon (AC) 21, WR 313 and GC 955 in the Gulf of Mexico and discovered rich gas hydrates. Log analysis indicates that gas hydrates concentrations in some sand reservoirs can exceed 90% (Boswell et al, FITI, 2009).