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**High-Resolution Seismic Imaging of the Hydrate Stability Zone: Mallik, Canada**

High-resolution seismic reflection data acquired over the Mallik site provides a rare glimpse at natural hydrate deposits in close proximity to this intensely hydrate studied site on the northeastern edge of the Mackenzie Delta, NW Territories, Canada. Several boreholes, geophysically logged and some cored, provide limited detailed control of the permafrost interval, hydrate stability zone, and the free gas contact. Reflection events within the hydrate stability zone correlate with good confidence to well data at this site. Reflections from over 1000 m possess resolution potential more than double conventional data acquired in this area. Separate hydrate zones can be identified within the 300 m thick hydrate stability zone. Hydrate layers within the stability zone vary in thickness and in some case appear to truncate across distances as short as 100 m. Amplitude anomalies possibly associated with the free gas boundary appear to define the base of the hydrate stability zone and therefore represent a phase boundary related to pressure and temperature. High velocity layer effects required substantial decimation of data fold at longer offsets to avoid degradation during CMP processing. Correlation of seismic events with well data allows confident extrapolation from the well bore and provides insights into the lateral variability of natural hydrate occurrences.