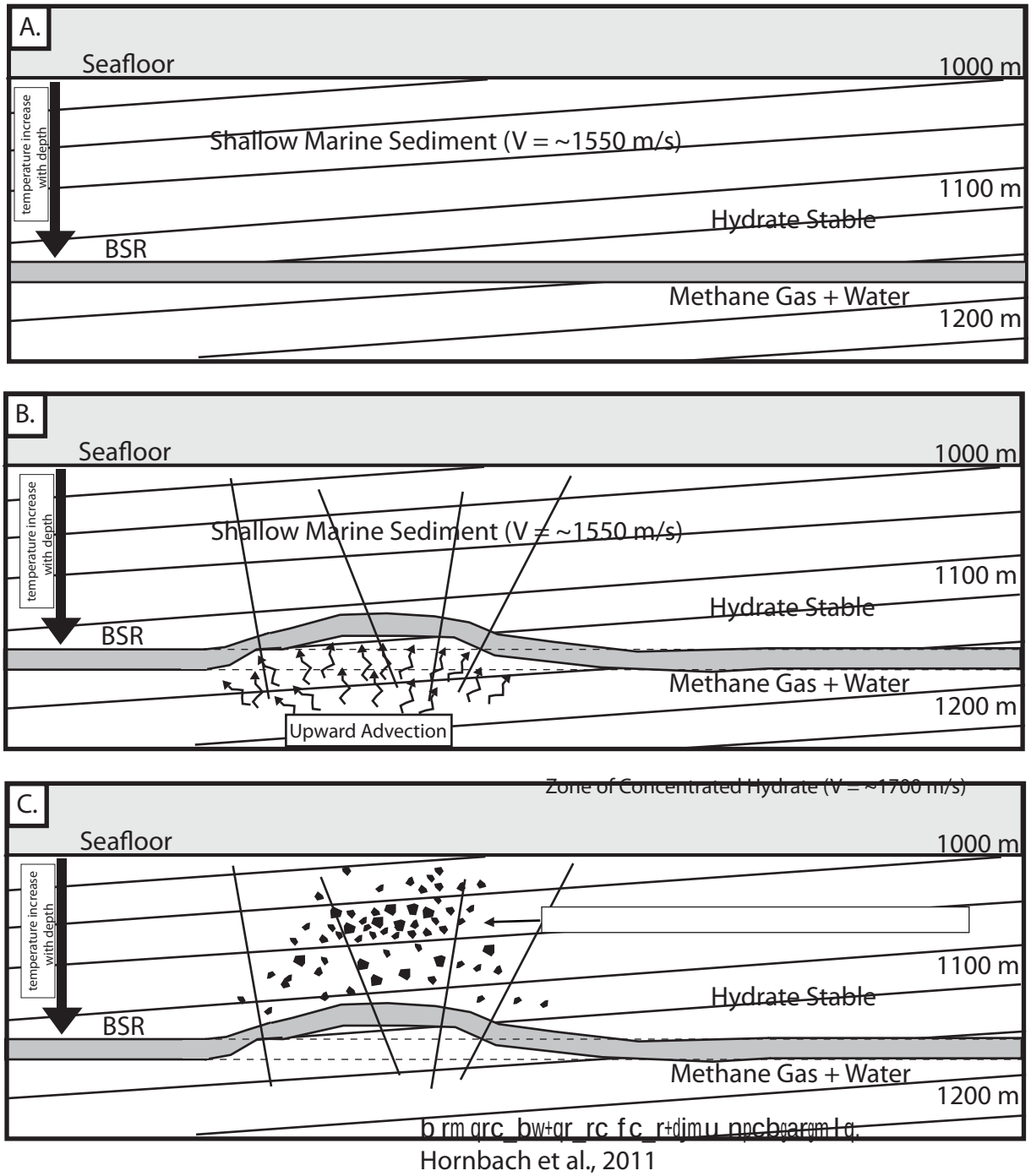

Hornbach et al., 2011

Figure DR1. Controls on the depth of the Gas Hydrate Stability Zone. A: Idealized cross section showing the depth of the gas hydrate stability zone if no fluid flow or seismic velocity anomalies exist. B: Cross section showing how upward advection fluids can drive the BSR to anomalously shallow depths compared to diffusive heat flow predictions (dashed lines). C: Cross section showing how high velocity zones caused by hydrate that are not correctly accounted for with seismic velocity models can also cause anomalously shallow BSRs compared to steady-state heat-flow predictions.

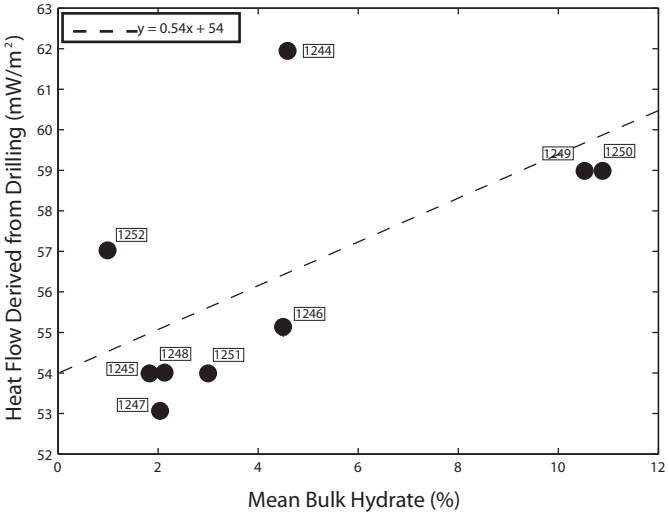

Figure DR2. Hydrate Concentration vs. Heat Flow. Hydrate concentrations are derived from Tréhu et al. (2004b) and represent mean values, such that estimates of 1%-8% hydrate noted in Tréhu et al. (2004b) are set to an average value of 3.5%. Despite significant uncertainty, hydrate concentrations generally increase with heat flow. A linear fit through the data (dashed line and equation) indicates hydrate concentrations increase at an average rate of 0.54% per mW/m2, and this linear trend matches drilling results with areas of highest shoaling yielding several percent bulk hydrate and areas of minimal shoaling yielding less than 1% bulk hydrate, similar to previous results across south Hydrate Ridge (Milkov et al., 2004; Tréhu et al., 2004b).