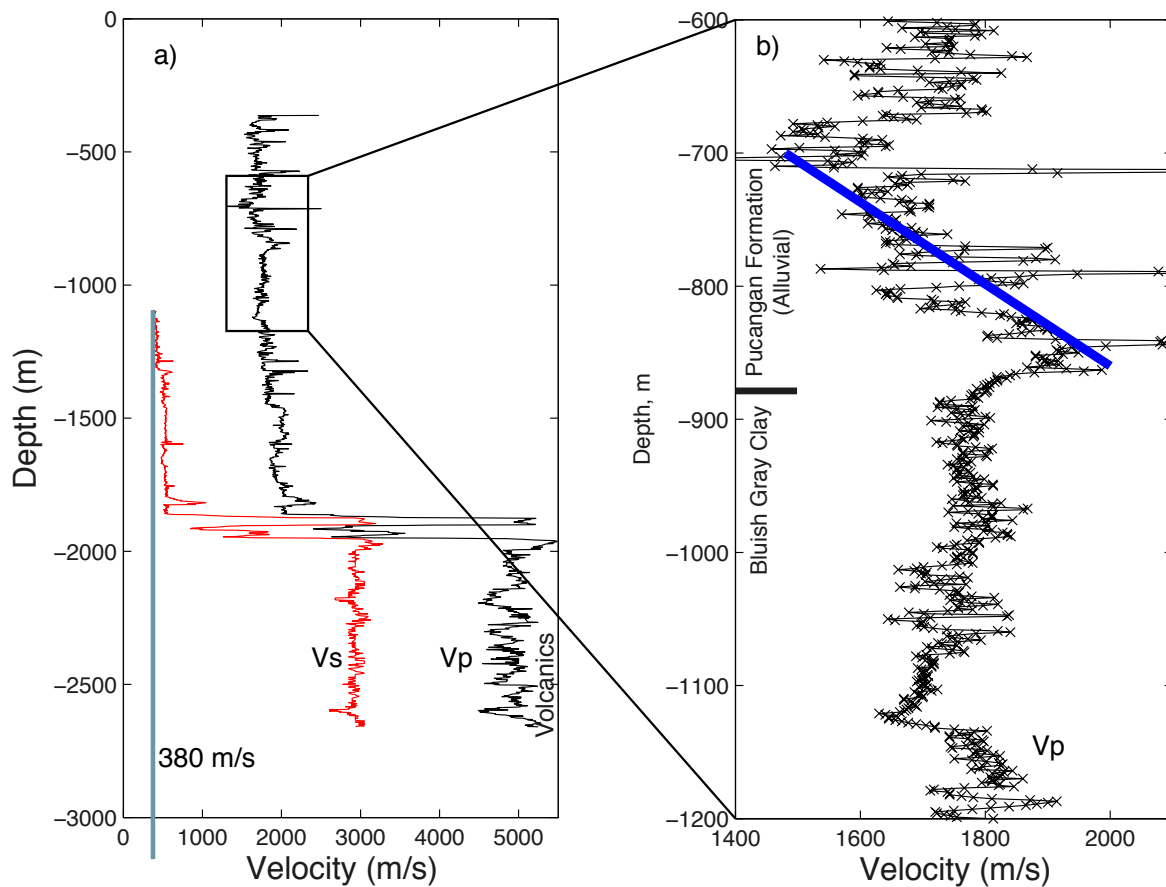
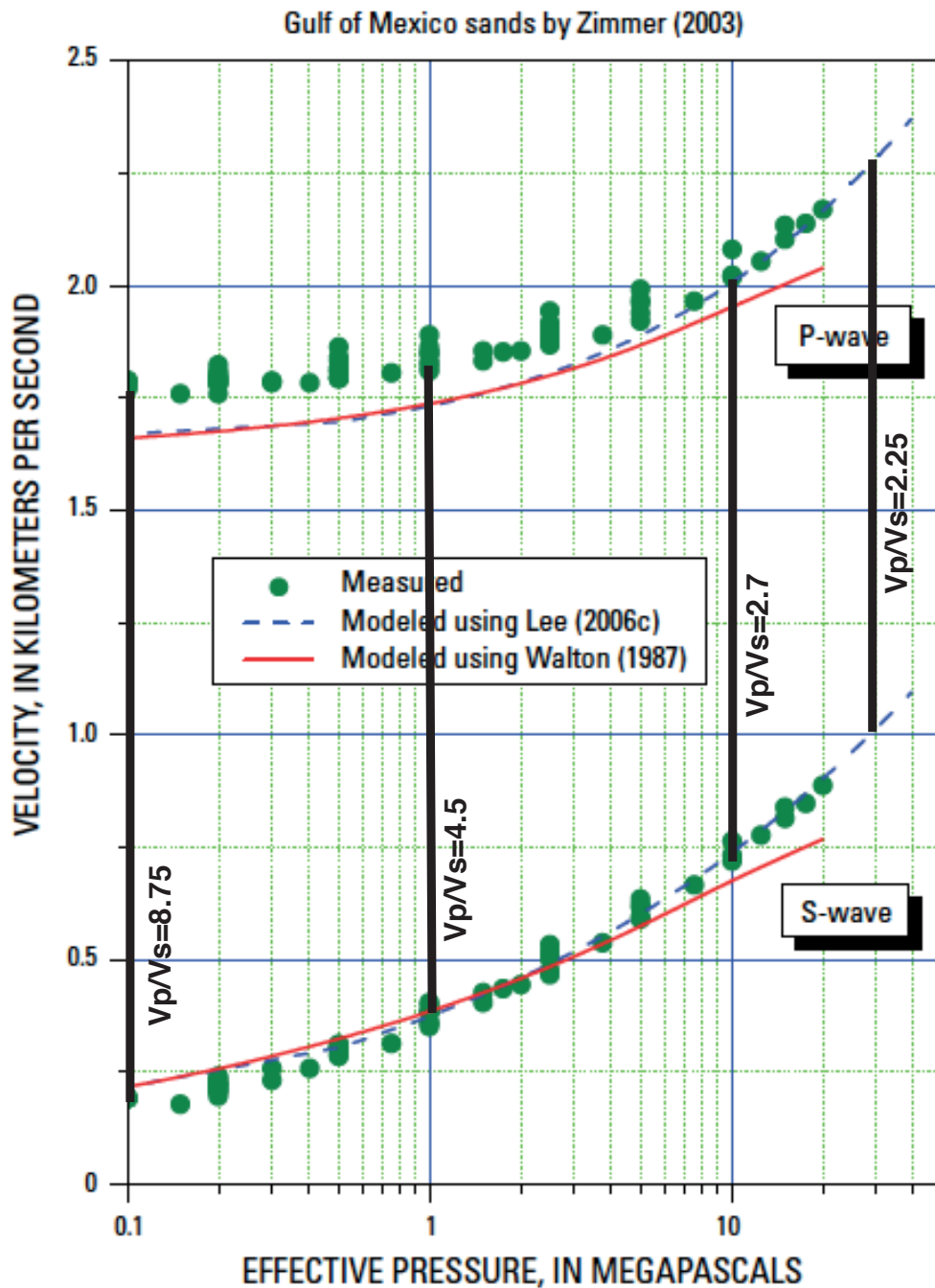


Lusi mud eruption triggered by geometric focusing of seismic waves

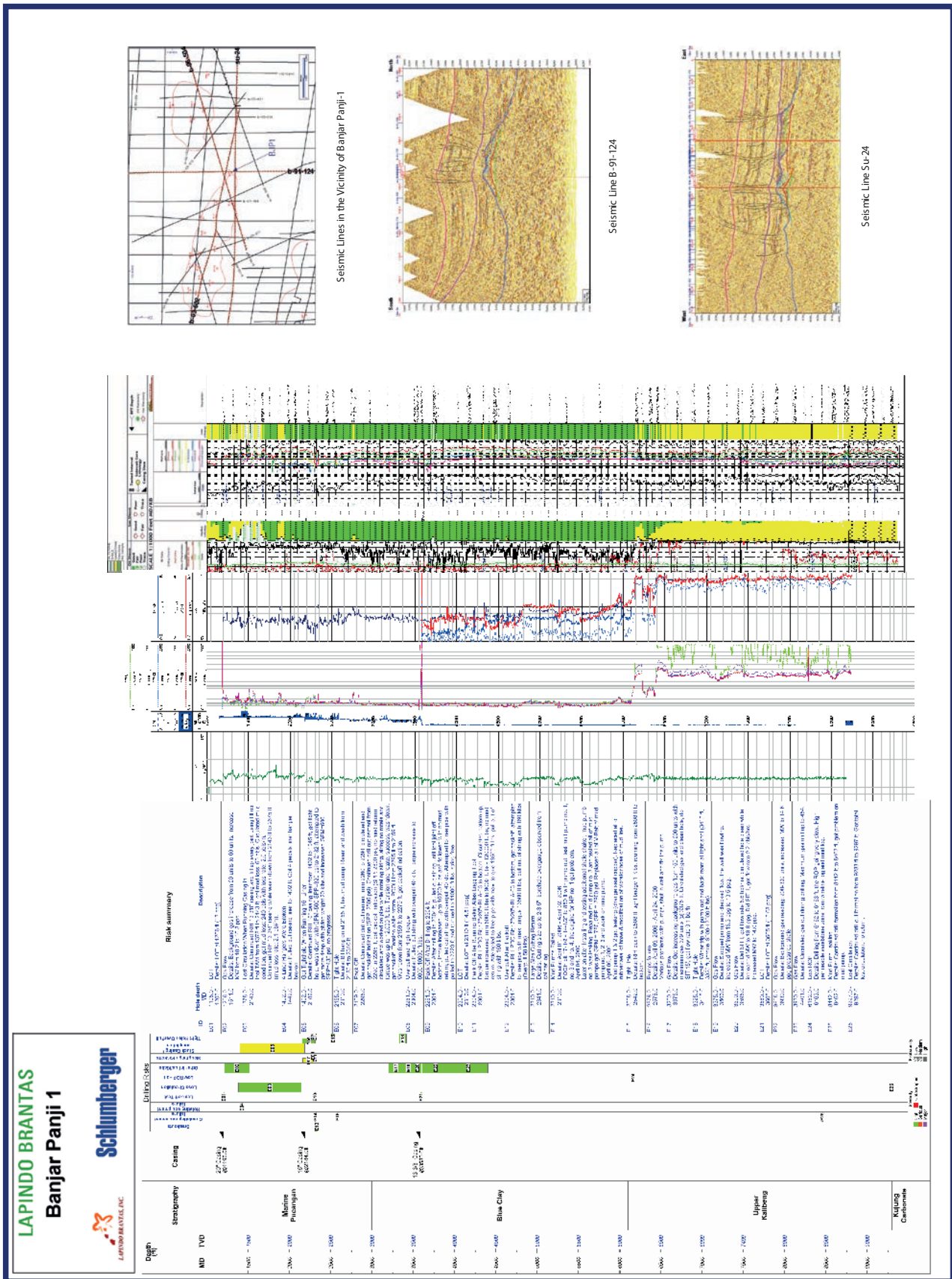
M. Lupi, E. H. Saenger, F. Fuchs and S. A. Miller



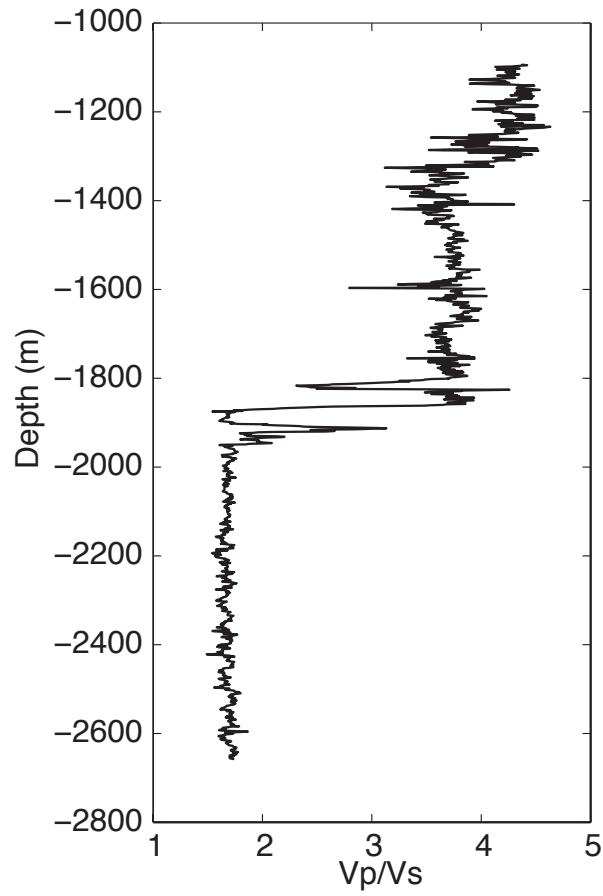
Supplementary Figure 1. Measured V_p and V_s profiles (a) from the BJP-1 borehole. The V_p record extends to about 300 m depth, while the V_s record does not begin until the casing shoe at about 1100 m depth. Notice that V_s is about 380 m/s in the mud layer. A zoom-in of a portion of the record (b) shows increasing V_p with depth above the mud layer, between about 700 m and 875 m depth (blue line), indicative of a normally compacting horizon. A reduction in V_p at depths from 875 m to 1150 m indicates significantly reduced effective stress from the over-pressured and under-consolidated mud layer.



Supplementary Figure 2. Experimental data showing large reductions in Vp/Vs ratios with increasing effective stress. We used the measured Vp of 2000 m/s at the top of the mud layer to estimate a Vs of about 750 m/s at this boundary. The recorded S-wave velocity of 380 m/s in the mud layer (Vp/Vs=4.5, supplementary fig 4) indicates low effective stress representative of an under-consolidated and over-pressured horizon, typically referred to as low-velocity zones. Modified from [Lee, 2010].



Supplementary Figure 3. The complete montage of the well log recorded for the BJP1 borehole. In our original study, we interpreted the top of the mud layer to exist at about 1,100 m depth based on a published velocity profile. However, well log data recorded at borehole BJP1 show that the mud layer begins at ~900 m and we have adjusted our analyses and interpretations accordingly.



Supplementary Figure 4. Measured Vp/Vs ratios showing persistently elevated ratios of about 4.5 within the mud layer indicative of a low effective stress (high pore pressure) environment.

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