Reprise of Pressure Prediction at EI-330

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Several different 'Equivalent Depth' approaches are used to predict pressure in the Eugene Island 330 A20-ST "Pathfinder" well. All approaches generate equivalent results yet under-predict direct pressure measurements observed in reservoir sands encountered in the well. The results indicate that equivalent-depth methods all predict similar results if the underlying effective-stress relationship is sound (e.g. velocity vs. effective stress or porosity vs. effective stress). Two approaches are then applied that are commonly used when equivalent-depth methods under-predict in-situ pressures: 1) simulating the effect of the smectite-illite transition (Lahann, 2002) and 2) simulating the effect of "unloading" or a reduction in effective stress with time (Bowers, 1995). The two approaches generate similar results and can successfully simulate the in-situ pressures. The fact that pressure predictions that account for either smectite diagenesis or unloading produce similar results in the same field suggest that we do not yet have a complete process-understanding of the mechanisms for overpressure.

References

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