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Pressure Regressions and Petroleum Entrapment- Examples from Azerbaijan and Trinidad

Subsurface pressures can be both a help and a hindrance to the explorationist. High subsurface pressures are often necessary to allow vertical migration of petroleum from the source to the reservoir by capillary leakage and fracture failure. Conversely, high pressure (low effective stress) is often the critical control on the maximum column height that can be retained in a reservoir once an accumulation has formed. It has been recognized worldwide that pressure regressions form highly effective hydrodynamic seals, allowing unusually large petroleum columns to be trapped. Pressure regressions generally have two modes of origin:

- 1) Lateral transfer of pressure in a dipping permeable reservoir may create a pressure regression in the downdip end of the reservoir.
- 2) Uplift and exposure of a reservoir at the surface may allow pressure to be drained off laterally through fluid movement. If the strata overlying the reservoir cannot be so effectively drained, perhaps due to differences in lithology, then a pressure regression can form.

We discuss examples of both types of pressure regression from Azerbaijan and Trinidad, and demonstrate how pressure regressions may be predicted using both geological and seismic based techniques.