Compaction and rock physics.

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Ongoing projects:

Properties of Cretaceous sedimentary rocks from the Norwegian Sea
A FORCE Project supported by Statoil, Hydro, Conoco and Gas de France.

Petrophysical properties of mudstones and sandstones and their seismic response (NFR Petromax project Start 2005).

Experimental compaction of carbonate sediments. (Funded by Univ. of Oslo), Started 1. Oct. 2006

Effects of Sediment Deposition, Compaction and Pore Fluid on Rock Properties and Seismic Signatures. A cooperation between Stanford University, Colorado School of Mines, Norwegian Geotechnical Institute, University of Bergen and University of Oslo (NFR Petromax project). Start Jan 2007.
The properties of sedimentary rocks are a function of provenance, depositional environment and diagenesis.
Comparing experimental compaction with data from well logs

Mondol, N.H., Bjørykke, K., Jahren, J.
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Stress in passive margin basins with mostly siliceous sediments

Most of the tectonic stress is transmitted through the basement and the well cemented sedimentary rocks. In the case of ice loading the strain rates are relatively high and the response in sediments will be mostly mechanical compaction. Gravitational stress may however be important.

Bjørlykke 2006
Conclusions

- The physical properties of sandstones carbonates and mudstones vary greatly as a function of primary composition and burial history.
- Experimental compaction of sediments may provide data for the modelling of mechanical compaction.
- Changes in rock physical parameters due to chemical compaction can be derived from compaction trends based on well logs.
- Mudstones show very wide ranges of physical properties as a function of clay mineralogy.
- The distribution of the physical parameters of sedimentary rocks depends on the primary sediment composition (provenance and facies) and the burial diagenesis (stress and temperature). This may help to constrain seismic inversion.
Recent publications on sediment compaction


