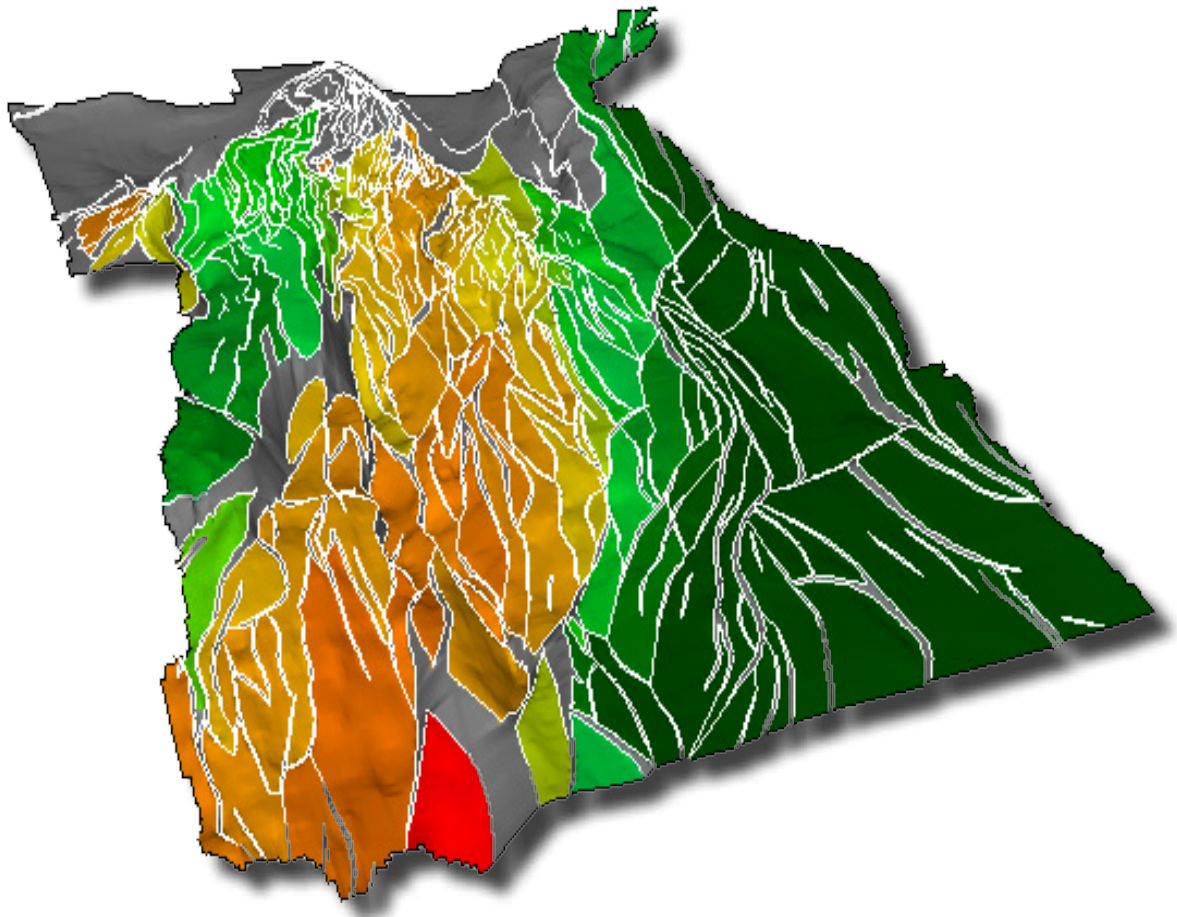# pressim

3D multi-purpose pressure simulation software

Pressure prognosis for

▶ Exploration

▶ Drilling

▶ Production
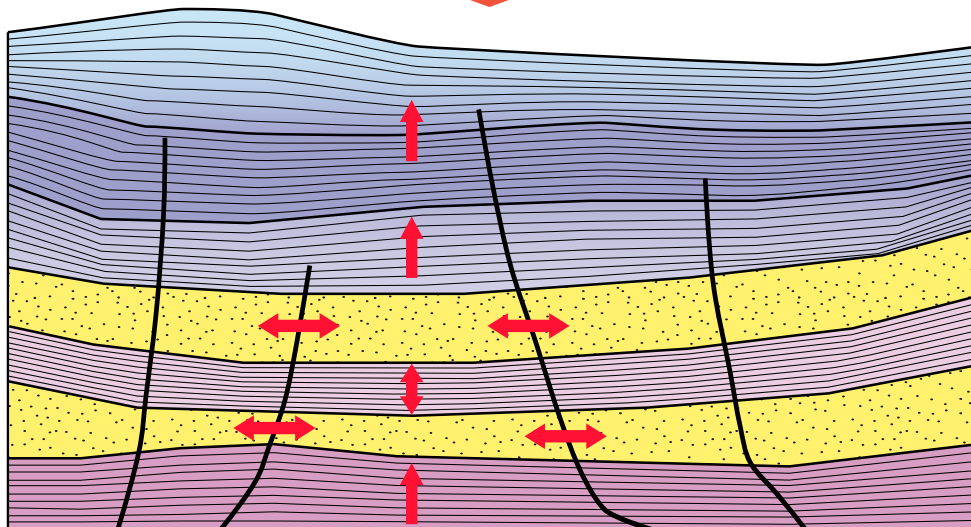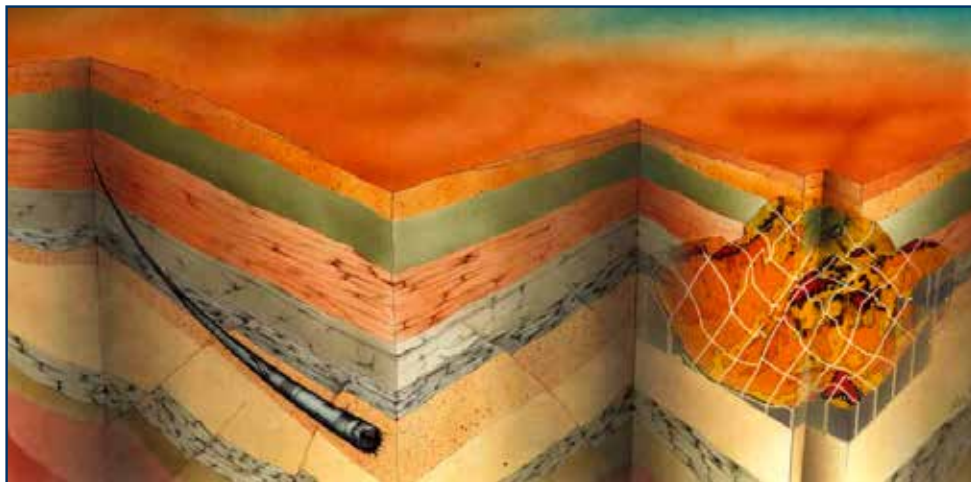
We offer

▶ Case studies

▶ Software

▶ R&D projects

From geologic to numerical credibility

Pressim defines the reservoir units into pressure compartments and performs pressure generation within and dissipation between the pressure compartments. In addition, the vertical flow through the sealing layers is quantified using the lithology information and adequate equations relating porosity and permeability.

|						
3D	3 Dimensions		Quartz Cementation		Hydraulic Leakage		Salt dome
	Compaction		Smectite-to-illite		Local Grid Refinement	
	Lateral Fluid Flow		Horisontal Stress		Well path	

All flow equations in Pressim are solved using numerical explicit solution techniques. The system of differential equations describing fluid flow and pressure dissipation is often unstable due to the low compressibility of the formation water. It is thus appropriate to use short time steps and a high level of accuracy to ensure that the correct solutions are found.

A local grid refinement (LGR) can be introduced to the Pressim model and thus a higher resolution of the modelled pore pressure can be provided in an area. Such grid refinements are useful around salt domes and along well paths.

Relevant information

The modelled present day overpressure can be calibrated to pressure measurements to ensure that the modelled pressure distribution reflects the representative conditions.

The pressure is one of the basic properties in the E&P work and can be used to:

- Primary migration
- Secondary migration
- Phase behaviour
- HC generation
- HC accumulation/leakage
- Hydraulic leakage
- Natural (aquifer) pressure support/communication
- Well planning
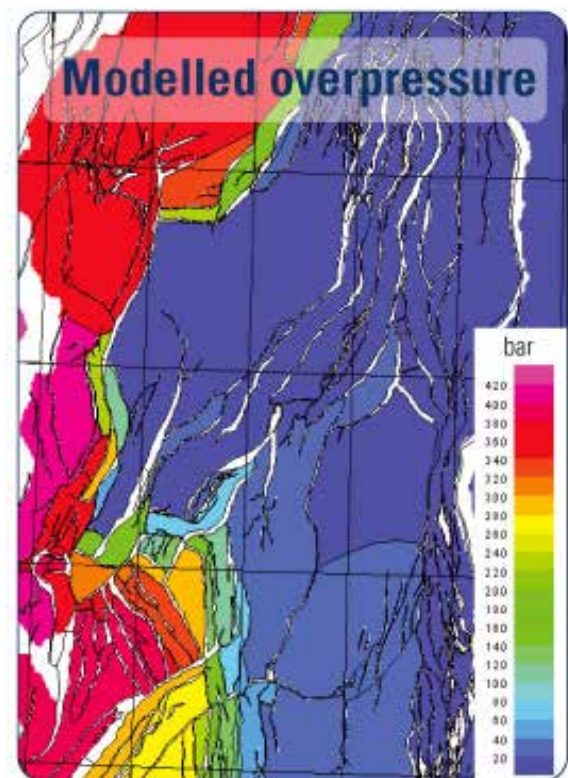
Why 3D?

When the formation water in a porous sedimentary basin is squeezed due to the compacting sediments overpressure will accumulate and the formation water will start flowing due to the potential differences. The fluid will then flow in all directions depending on the permeability distributions and available escape routes/flow paths. If a realistic flow pattern and the resulting pressure distribution are going to be re-created all three dimensions have to be included in the model.
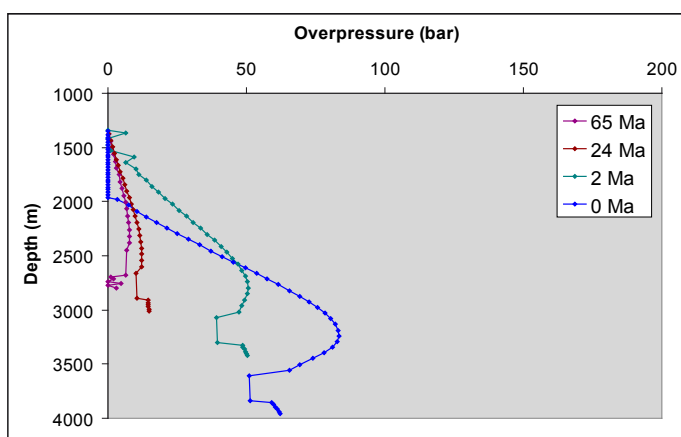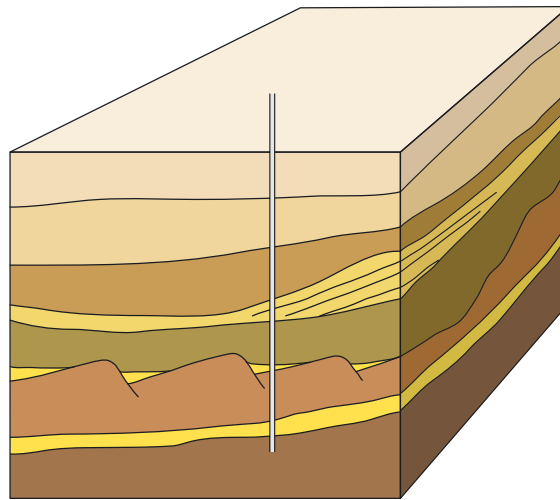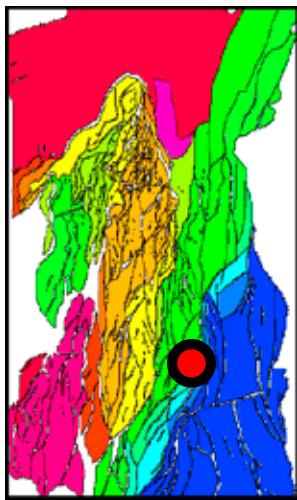

3D model – including lateral flow
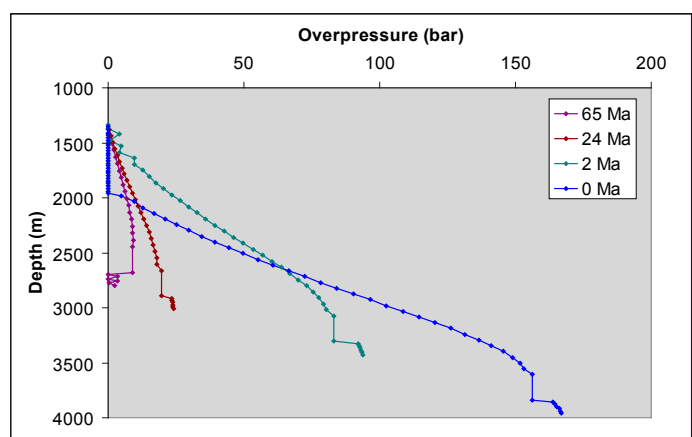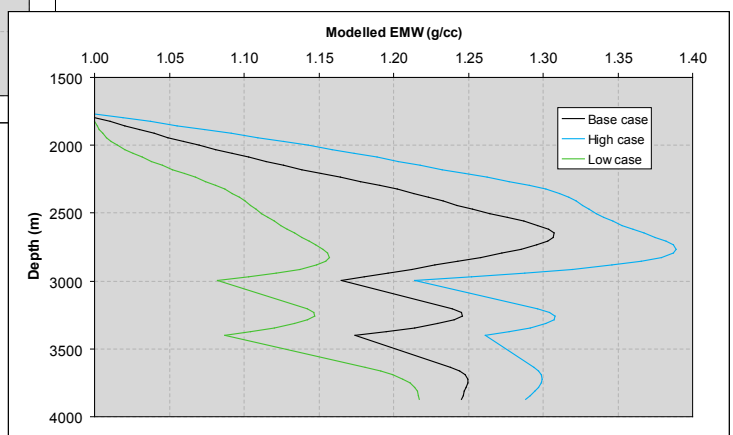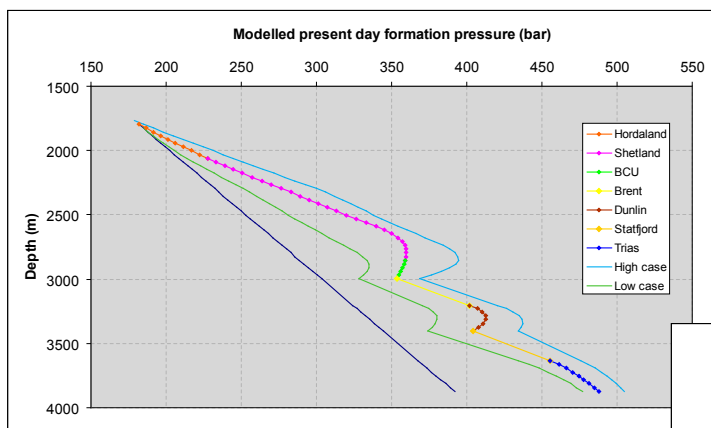

1D mode – no lateral flow

Prior to drilling - Updated while drilling

It is of great importance to have a pressure prognosis along the well path prior to drilling. Pressim can estimate base-, high- and low case along a well path based on the 3D model. A Pressim case study may provide pressure prognosis for several well locations within the study area. The Pressim model can also be re-calibrated during the drilling operation if necessary.

Such pressure prognosis can be used to:

- Bore hole stability evaluation
- Mud weight optimization
- Avoiding drilling hazards
- Reduce non-productive time (NPT) for the rig
- Optimized well placement
- Drilling in depleted reservoirs

Modelled present day formation pressure (bar)

Legend: Hordaland, Shetland, BCU, Brent, Dunlin, Statfjord, Trias, High case, Low case

Modelled EMW (g/cc)

Legend: Base case, High case, Low case