

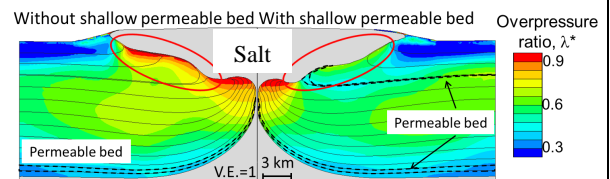
## 9.23 Effects of a shallow permeable bed on geomechanics and evolution of a salt sheet

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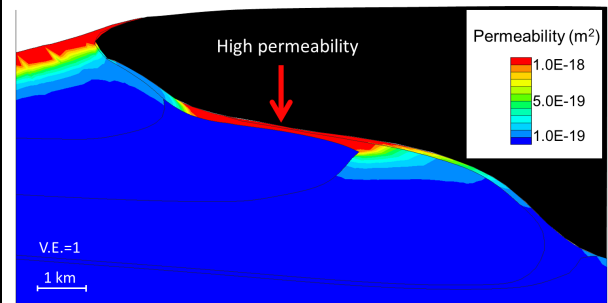
### ABSTRACT

We use a forward finite-element model to investigate the impacts of a shallow and a basal permeable bed on the evolution of a salt sheet and on pressure and stresses below it. We show that the basal bed significantly affects the evolution of the salt sheet while the shallow bed has an insignificant effect on this evolution. The basal bed conducts a strong pore water flow toward the salt sheet, increasing pressure near salt. In contrast, the shallow bed conducts a strong pore water flow away from the salt sheet, decreasing pressure below the sheet (Fig. 1) and thereby allowing for larger appropriate mud weight margin for drilling wellbores below salt. We also illustrate how a narrow highly-sheared zone with high porosity and permeability can develop below a salt sheet as a result of stretching and shearing by the salt sheet emplacement (Fig. 2).

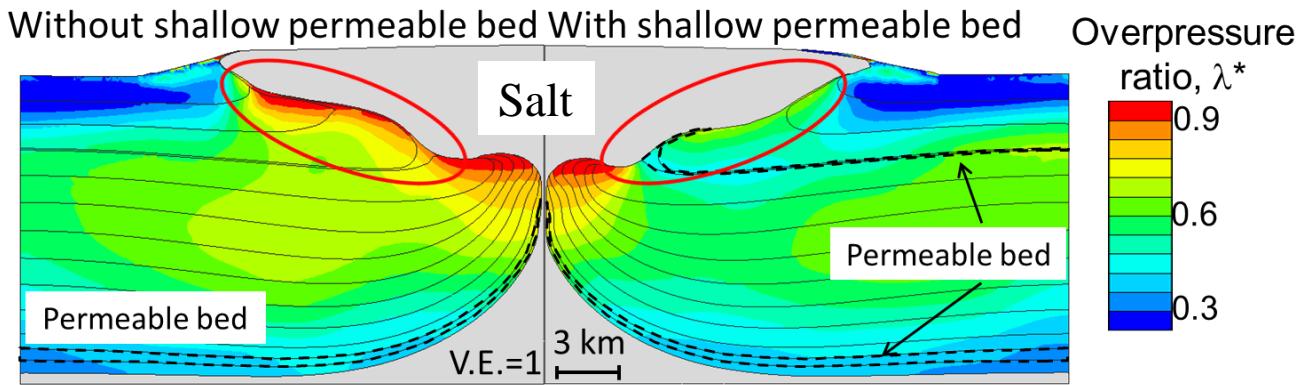
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**Fig. 1:** Overpressure ratio below salt sheet in basin with and without shallow permeable bed. Shallow bed significantly decreases this ratio below salt sheet.

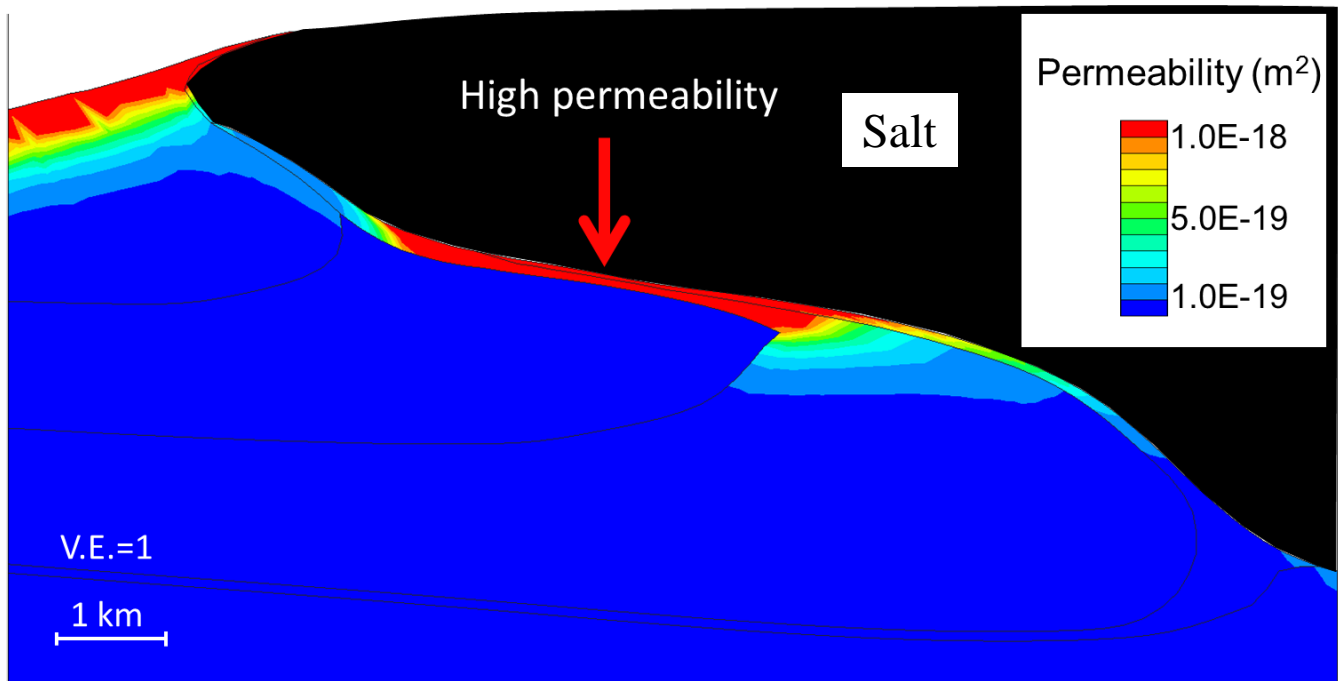


**Fig. 2:** A narrow zone below salt sheet with distinctively high permeability. Emplacement of salt sheet causes dramatic stretching and shearing of this zone, resulting in high porosity and permeability.



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**Figure 2:** A narrow zone below salt sheet with distinctively high permeability. Emplacement of salt sheet causes dramatic stretching and shearing of this zone, resulting in high porosity and permeability.

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