

Simplified Analysis of Rising Salt Domes

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ABSTRACT

We use a simple analytical approach to estimate the stress change in sediments near rising salt domes (Figure 1). We show that, the stress ratio near salt domes increases; it is equal to 1 for uncompacted sediments (due, for example, to the presence of overpressures), and greater than 1 for compacted basins (for example, Gulf of Mexico).

We also calculate the critical sedimentation rate to bury a salt dome, and show that the burial of a salt dome would be unlikely in compacting sediments; Figure 2. However, a critical sedimentation rate can be found for uncompacted basins. Our analytical approach describes the essential mechanism underlying the rising of salt domes, and has a great potential to provide useful insights into the stress change near rising salt domes.

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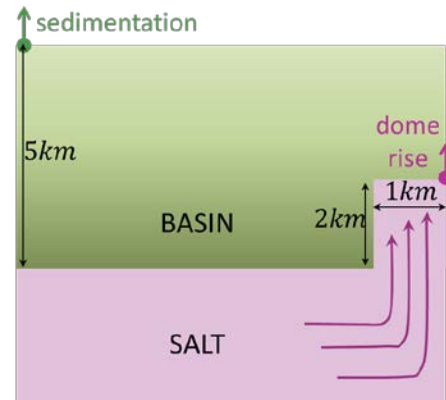


Fig. 1: We develop analytical models to predict stress changes for a simple cylindrical salt diapir rising within a sedimenting basin.

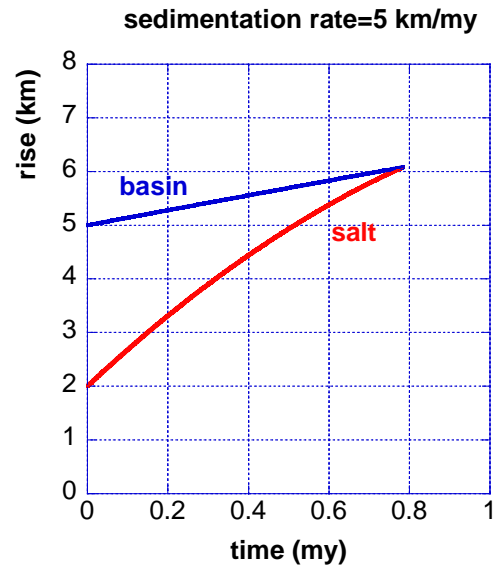


Fig. 2: Salt rise vs. basin rise during sedimentation of a compacting basin. The salt dome eventually outcrops and never becomes buried.

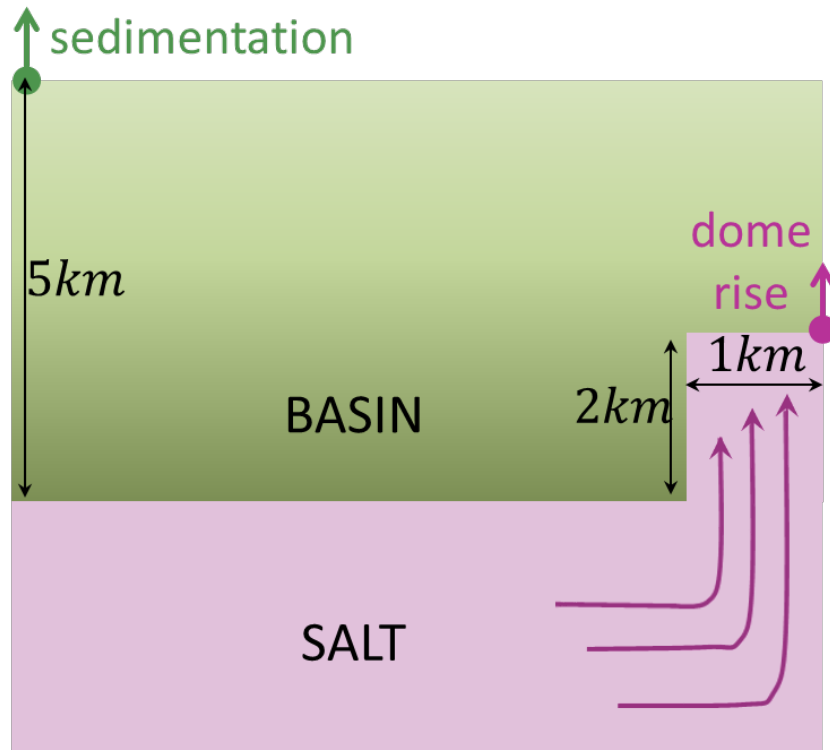


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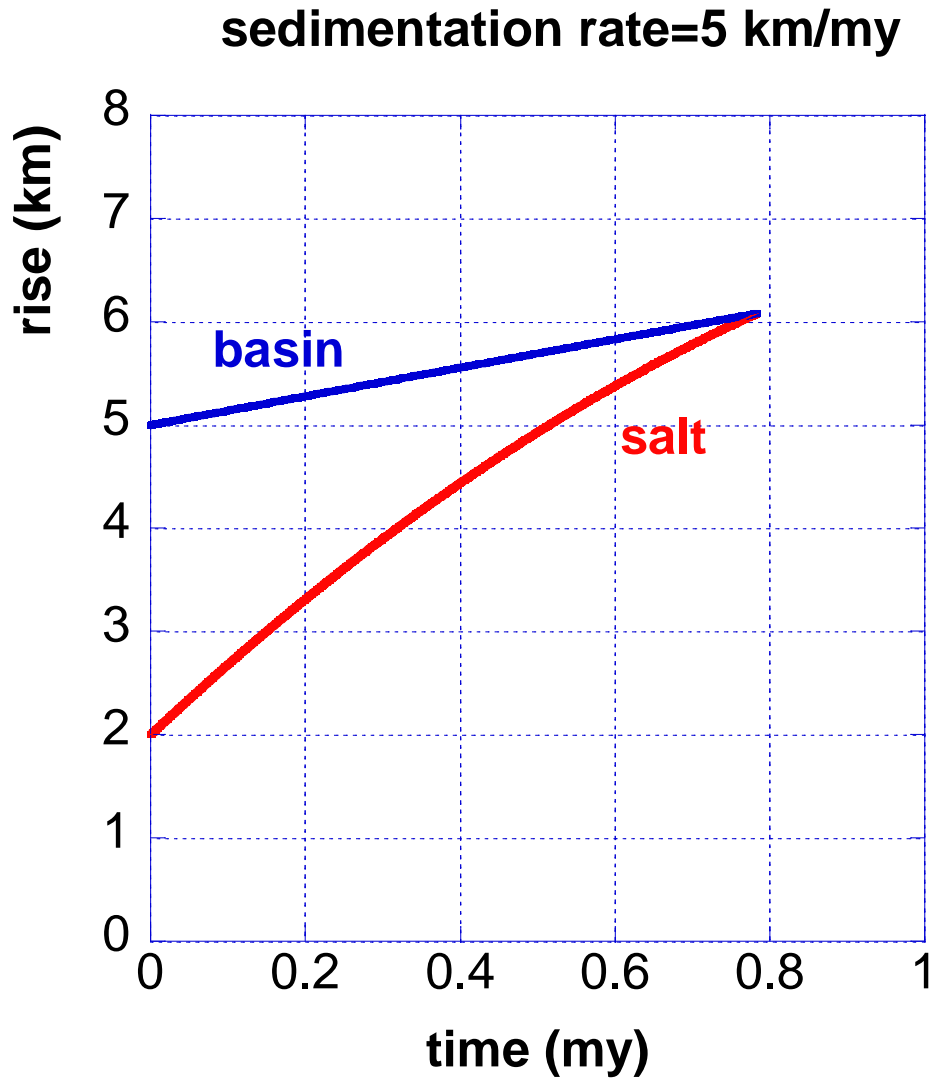


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