



Lateral mobility of minibasins during shortening: Insights from the SE Precaspian Basin, Kazakhstan

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Minibasin provinces are widespread and can be found in all types of salt tectonic settings, many of which are prone to shortening. Previous studies of how minibasin provinces shorten assume that the salt between the minibasins is homogeneous and that the base of salt is flat or of low relief, such that minibasins are free to move laterally. Here we investigate how minibasin provinces respond to shortening when the lateral mobility of the minibasins is restricted by intra-salt sediment bodies. We examine a borehole-constrained, 3D seismic reflection dataset from the SE Precaspian Basin (onshore western Kazakhstan). The study area is characterised by large, supra-salt minibasins and an array of smaller intra-salt sediment packages distributed between these larger minibasins. We first outline the evidence of episodic shortening between the Late Triassic and present-day, after the onset of supra-salt minibasin subsidence. Next, we document spatial variations in shortening style, showing how these relate to the concentration of intra-salt sediment packages. Finally, we develop synoptic models showing how intra-salt sediment packages influence both the lateral mobility of minibasins during shortening and the resultant structural style, and we compare and contrast our findings with existing models and other natural examples of shortened minibasin provinces. We conclude that minibasin provinces may have different degrees of lateral mobility depending on the presence, or absence, of intrasalt barriers, and that these variations provide a first-order control on basin-shortening style and tectono-stratigraphic evolution.