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**Turtle Structures and Expulsion Rollovers: Lessons Derived from a Comparison Between the Northern Gulf of Mexico and the Precaspian Basin, Kazakhstan**

Both axially symmetric turtle structures and asymmetric expulsion rollovers are common in the eastern Precaspian Basin, Kazakhstan, and the northeastern Gulf of Mexico (GoM). Yet there are differences in location and geometry that provide important lessons for understanding the controls on progressive salt movement. Expulsion rollovers are typically located updip of turtles in the GoM but downdip of turtles in the Precaspian. Moreover, the orientations of both types of structures vary. GoM expulsion-rollover geometries record basinward salt movement, whereas Precaspian expulsion rollovers have highly variable orientations. Turtles in the Precaspian have a common orientation, with the axes parallel to the basin edge, whereas those in the GoM have variable orientations.

The differences in location and geometry in the two basins are attributed to a combination of surface slope and regional deformation. Expulsion rollovers in the GoM formed on the continental slope, so that salt was generally extruded basinward. In contrast, the depositional environment in the Precaspian was a subaerial flood plain with effectively no regional slope, so that salt was extruded in multiple directions from laterally shifting minibasins that controlled the geometry of fluvial systems. Precaspian turtle structures are proximal and linear because they were triggered shortly after salt deposition by thin-skinned extension into the basin. Many GoM turtles, on the other hand, formed by relatively late collapse of inflated salt plateaus in an abyssal plane setting. Basinward translation of a preestablished framework of minibasins and salt bodies during gravity spreading resulted in turtles with variably-oriented axes.