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Mapping mud volcanoes in the South Caspian Basin

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Ninety-nine mud volcanoes have been mapped in the South Caspian Basin, offshore Azerbaijan. Of these 70% are situated above anticlines that are associated with faults. The remaining mapped mud volcanoes are on the flanks of the anticlines or on the synclines. Four types have been recognized-concave, convex, flat and buried. These differences in morphology may result from the relationship between driving force (pressure) and material supply, width of conduit or could represent different stages in mud volcano evolution. The mud volcano development commenced in the Lower Pliocene with the greatest activity during the Upper Pleistocene. The cycles of mud volcano activity coincides with time of high sedimentation rate, a regional contraction episode, and a major stage for hydrocarbon generation.

Mud volcanism in the offshore region of the South Caspian Basin is associated with high fluid pressure gradients (diatremes) in the subsurface and not with diapirism as observed onshore. Further, the offshore activity may not always be related to the Maykop shale succession as believed to occur onshore but may occur at younger stratigraphic sections.