

## **Mesozoic-Paleozoic Paleogeographic Evolution of the Arabian Plate**

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### **ABSTRACT**

We have mapped depositional environments and lithofacies as the basis for evaluating source, reservoir, and seal rocks. Each map represents about 6 MY in the Paleozoic and less than 3 MY in the Mesozoic, and in some cases less than 1 MY. The maps show depositional trends and illuminate large-scale sedimentary and tectonic processes that affected the Arabian Plate.

The normal orientation of facies belts was 120-130° throughout the Phanerozoic, with shorelines commonly near the eastern edge of the Arabian Shield. A notable exception was the Lower Cretaceous, when facies belts trended 155-165° due to uplift of the western side of Arabia.

The sea flooded the northern Arabian Plate (NAP) in the Early Cambrian, reaching the southern Arabian Plate (SAP) in the Late Cambrian. There were several large transgressions and regressions in the Ordovician. Silurian sediments prograded from the Arabian Shield and Syria-Turkey to the east. Marine conditions stayed on the far northeastern margin of the plate in Devonian-Early Carboniferous. The sea flooded the plate from the northeast in the Late Permian.

Regional uplift occurred at different times across the Arabian Plate: the Central Arabian Arch in Silurian; the Burgan and Ghawar arches in Permian-Carboniferous, along with highs in Zagros and southern margin of SAP; the Hail Arch from Early Triassic to present and the Qatar Arch from Late Triassic to present; uplift and erosion of the southern margin of SAP and Zagros in Late Triassic-Early Jurassic; and a high that ran down the Gulf during Middle-Late Jurassic, with subsidence forming an intrashelf basin in the SAP.

The earliest subsidence of the Gotnia Basin was in Triassic to Early Jurassic, and the deep basin formed in Middle- Late Jurassic. Cretaceous sediments prograded from the west and south across the Mesopotamian Basin in the Cretaceous. Northeast Oman subsided in the Early Cretaceous, and the Bab-Shilaif Basin and a basin in the Dezful region were present from Aptian to Turonian. The Palmyride Trough rifted in Early to Late Triassic, the Yemen rifts formed in the Late Jurassic, and the Euphrates, Wadi As Sirhan and Anah grabens were active in the Late Cretaceous.