

AP15

## An Outcrop Reference Model for the Late Albian-Turonian Carbonate Platforms of the Arabian Plate, Sarvak Formation, Iran

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### SUMMARY

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A high resolution sequence stratigraphic model has been constructed for the mid-Cretaceous Sarvak Formation in the High Zagros (Iran). The exceptional outcrop quality, displaying the detailed geometrical and facies patterns in the transition zone from carbonate platform to intrashelf basin, offered the rare opportunity to distinguish between the relative control of carbonate sediment supply and accommodation on the depositional geometries of 3rd order and 4th order depositional sequences. A significant distinction has been made in the 3rd order sequences between the early transgression (e-TST) when the system is still flat, and corresponds to a ramp setting, and the late transgression (l-TST) when a carbonate platform to intrashelf basin topography is created. The rate of accommodation creation is identified as the dominant factor controlling the morphology of the depositional profile, and, as such, the driving motor behind the dynamics of this type of carbonate system. The dip angle of the depositional profile has a major influence on: (1) the hydrodynamics of the system, (2) the type of carbonate sediment, and (3) the volume of carbonate sediment produced. This outcrop analogue can be considered as a good reference model for Cenomanian-Turonian carbonate platform margins of the Arabian Plate.

A high-resolution sequence stratigraphic model has been constructed for the mid-Cretaceous Sarvak Formation in the High Zagros region of southwest Iran, which was located close to the eastern margin of the Arabian Plate. The exceptional outcrop quality, displaying the detailed geometrical and facies patterns in the transition zone from carbonate platform to intra-shelf basin, offered the rare opportunity to distinguish between the relative control of carbonate sediment supply (S) and accommodation (A) on the depositional geometries of third-order and fourth-order depositional sequences.

Four third-order sequences are distinguished in the Sarvak Formation, with a duration varying between 1.5 and 3 My, and a thickness varying between 50 to 150 m. These are in turn composed of fourth-order and fifth-order sequences that form the stratigraphic building blocks of this carbonate system. A significant distinction has been made in the third-order sequences between the early transgression (e-TST) when the system is still flat, and corresponds to a ramp setting, and the late transgression (l-TST) when a carbonate platform to intra-shelf basin topography is created. The rate of accommodation creation is identified as the dominant factor controlling the morphology of the depositional profile, and, as such, the driving motor behind the dynamics of this type of carbonate system. The dip angle of the depositional profile has a major influence on: (1) the hydrodynamics of the system, (2) the type of carbonate sediment, and (3) the volume of carbonate sediment produced. A good correlation with the third-order sequences of the Natih Formation in Oman is demonstrated, which supports a dominant control by eustatic sea-level changes and a similar response of the carbonate system to changes in the rate of sea level rise on the southern part of the Arabian Plate.

This outcrop analogue can be considered as a good reference model for Cenomanian – Turonian carbonate platform margins of the Arabian Plate, but also as a textbook example of the response of carbonate systems to sea-level fluctuations (relative influence of accommodation and sediment supply).