

The Aptian carbonate platforms of the Maestrat Basin: sequence stratigraphy, geometries, architecture, facies heterogeneities and relative sea-level drops.

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Duration: 4 days

During the Aptian, in the western Maestrat Basin, exceptional exposure and preservation of platform-to-basin stratal architecture at seismic scale permits the tracing of five stratigraphic surfaces with sequence stratigraphic significance. The main objective of this fieldtrip is thus to provide an outcrop scale example of a four systems tract-based sequence stratigraphic analysis that may serve as a model for both industry and academe for the application of the “four-systems-tract” method to carbonate-dominated successions. Additional goals are to examine in detail the architecture of the sedimentary bodies, the facies heterogeneity, and the preserved carbonate producers, principally corals and rudist bivalves. The epeiric sedimentary expression of the Early Aptian Oceanic Anoxic Event (OAE1a), which is represented by coral rubble deposits encrusted by *Lithocodium aggregatum* Elliott will be also visited.

Throughout the Aptian, in the northern Maestrat Basin, fault controlled subsidence created depositional space, but eustasy governed changes in depositional trends. Relative sea-level history was reconstructed by sequence stratigraphic analysis. Two forced regressive stages of relative sea level were recognized within three depositional sequences. The first stage is late Early Aptian age and is characterised by foreshore to upper shoreface sedimentary wedges, which occur detached from a highstand carbonate platform, and were deposited above basin marls. The amplitude of relative sea-level drop was on the order of tens-of-metres, with a duration of <1My. The second stage of relative sea-level fall occurred within the Late Aptian and is recorded by an incised valley that, when restored to its pre-contractual attitude, was >2 km wide and cut ≥ 115 m down into the underlying Aptian succession. With the subsequent transgression the incision was back-filled with peritidal to shallow subtidal deposits. The outcrops recognised in this fieldtrip are significant because they preserve the results of Aptian long-term sea-level trends that are often only recognizable on larger scales, (i.e. seismic), such as for the Arabian Plate.

Key references:

- Bover-Arnal, T., Salas, R., Moreno-Bedmar, J.A. & Bitzer, K. (2009): Sequence stratigraphy and architecture of a late Early-Middle Aptian carbonate platform succession from the western Maestrat Basin (Iberian Chain, Spain). *Sedimentary Geology*, 219: 280-231
- Bover-Arnal, T., Moreno-Bedmar, J.A., Salas, R., Skelton, P.W., Bitzer, K. & Gili, E. (2009): Sedimentary evolution of an Aptian syn-rift carbonate system (Maestrat Basin, E Spain): effects of accommodation and environmental change. *Geologica Acta*, 8-3: 249-280
- Bover-Arnal, T., Salas, R., Martín-Closas, C., Schlagintweit, F., Moreno-Bedmar, J.A. (2011): Lower Aptian coral rubble deposits from the western Maestrat Basin (Iberian Chain, Spain): records of chemical and physical disturbances. *Palaios*, 26: 18-32.
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