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**A Multi-Proxy Approach to Sequence Stratigraphy: Deeper-Water Epeiric Carbonates (Upper Jurassic, Southwest Germany)**

The sequence stratigraphy of shallow-water carbonate systems is relatively straightforward, due to their variety of grain types, facies and textures and is well documented from many examples. Deciphering sequence stratigraphic patterns in deeper-water carbonates, however, is more ambiguous, as these tend to be more uniform and less diverse in their sedimentary inventory. Sedimentological criteria alone are often not sufficient to characterize the stratigraphic architecture and understand controlling factors. We have used a combination of sedimentological (facies, cycle analysis), petrophysical (gamma-ray logs, whiteness index), palynological (marine versus terrestrial palynoclasts) and geochemical (stable isotopes) proxies to better understand deeper-water realms of an extensive epeiric shelf in Central Europe, marginal to the Tethys ocean.

Major lithofacies types are limited to basinal marlstones, bedded limestones and sponge/microbial mounds. These are stacked systematically into several orders of stratigraphic cycles that are commonly composed of both shallowing- and deepening-upward hemicycles. This is in marked contrast to the asymmetrical parasequences known from shallow-shelf settings. The sequences of all hierarchical levels show generally gradual vertical facies successions and a lack of sharp stratal surfaces such as distinct sequence boundaries or maximum flooding surfaces.

Particularly the use of palynofacies analysis in addition to sedimentology resulted in surprising insights into the complex interplay of the controlling factors sealevel, paleoclimate and paleoceanography.