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# Effects of large sea-level variations in connected basins: the Dacian - Black Sea system of the Eastern Paratethys

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Sea-level changes provide an important control on the interplay between accommodation space and sediment supply, in particular for shallow-water basins where the available space is limited. Sediment exchange between connected basins separated by a subaqueous sill (bathymetric threshold) is still not well understood. When sea-level falls below the bathymetric level of this separating sill, the shallow-water basin evolution is controlled by its erosion and rapid fill. Once this marginal basin is filled, the sedimentary depocenter shifts to the open marine basin (outward shift). With new accommodation space created during the subsequent sea-level rise, sediment depocenter shifts backwards to the marginal basin (inward shift). This new conceptual model is tested here in the context of Late Miocene to Quaternary evolution of the open connection between Dacian and Black Sea basins. By the means of seismic sequence stratigraphic analysis of the Miocene-Pliocene evolution of this Eastern Paratethys domain, this case study demonstrates these shifts in sedimentary depocenter between basins. An outward shift occurs with a delay that corresponds to the time required to fill the remaining accommodation space in the Dacian Basin below the sill that separates it from the Black Sea. This study provides novel insight on the amplitude and sedimentary geometry of the Messinian Salinity Crisis (MSC) event in the Black Sea. A large (1.3 - 1.7km) sea-level drop is demonstrated by quantifying coeval sedimentation patterns that change to mass-flows and turbiditic deposits in the deep-sea part of this main sink. The post-MSC sediment routing continued into the present-day pattern of Black Sea rivers discharge.