



Cenomanian to Campanian sea-level history of the Tarfaya basin (SW Morocco): Evidence from high-resolution XRF scanner-derived elemental records and bulk carbonate stable isotopes

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The Cenomanian to Campanian organic-rich successions deposited in the continuously subsiding Tarfaya Atlantic coastal basin (SW Morocco) allow detailed reconstruction of depositional environments at the upper edge of an oceanic oxygen minimum zone impinging on a broad continental shelf. We present high-resolution X-ray fluorescence (XRF) scanning, bulk carbon and oxygen isotopes and natural gamma-ray (NGR) records from three newly drilled sedimentary cores in the Tarfaya Basin, which recovered a continuous sedimentary succession of more than 600 m thickness. A negative carbon isotope excursion in the late Cenomanian, at the onset of Oceanic Anoxic Event (OAE) 2, can be related to intense emissions of mantle CO₂ into the atmosphere. The following positive excursion, associated with increased marine productivity and carbon burial, occurred stepwise and was accompanied by transient climate cooling. Five upper Turonian to lower Campanian sequences are recognizable in the Tarfaya wells and can be correlated to global eustatic sequences established along the New Jersey Margin and in European shelf basins. The base of the last of these sequences is located within the positive carbon isotope excursion of the Santonian-Campanian Boundary Event. In the Tarfaya succession, this lower Campanian sequence is associated with a long-term cooling trend, expressed in the $\delta^{18}\text{O}$ record, and with major changes in the amount and composition of terrigenous input, indicating cooler and wetter climate conditions in the source area.

Key words: Late Cretaceous, Tarfaya Basin, bulk carbon and oxygen isotopes, oceanic anoxic event, sea-level.