**Modelling Tidal Current-Induced Bed Shear Stress and Palaeocirculation in an Epicontinental Seaway: the Bohemian Cretaceous Basin, Central Europe**

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Lower to Middle Turonian deposits within the Bohemian Cretaceous Basin (Central Europe) consist of coarse-grained deltaic sandstones passing distally into fine-grained offshore sediments. Dune-scale cross-beds superimposed on delta-front clinoforms indicate a vigorous basinal palaeocirculation capable of transporting coarse-grained sand across the entire depth range of the clinoforms (ca 35 m). Bi-directional, alongshore-oriented, trough cross-set axes, silt drapes and reactivation surfaces indicate tidal activity. However, the Bohemian Cretaceous Basin at this time was over a thousand kilometres from the shelf break and separated from the open ocean by a series of small islands. The presence of tidally-influenced deposits in a setting where co-oscillating tides are likely to have been damped down by seabed friction and blocked by emergent land masses is problematic. The Imperial College Ocean Model, a fully hydrodynamic, unstructured mesh finite element model, is used to test the hypothesis that tidal circulation in this isolated region was capable of generating the observed grain-size distributions, bedform types and palaeocurrent orientations. The model is first validated for the prediction of bed shear stress magnitudes and sediment transport pathways against the present-day North European shelf seas that surround the British Isles. The model predicts a microtidal to mesotidal regime for the Bohemian Cretaceous Basin across a range of sensitivity tests with elevated tidal ranges in local embayments. Funnelling associated with straits increases tidal current velocities, generating bed shear stresses that were capable of forming the sedimentary structures observed in the field. The model also predicts instantaneous bi-directional currents with orientations comparable with those measured in the field. Overall, the Imperial College Ocean Model predicts a vigorous tide-driven palaeocirculation within the Bohemian Cretaceous Basin that would indisputably have influenced sediment dispersal and facies distributions. Palaeocurrent vectors and sediment transport pathways however vary markedly in the different sensitivity tests. Accurate modelling of these parameters, in this instance, requires greater palaeogeographic certainty than can be extracted from the available rock record.