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The Holocene palaeogeography and relative sea level for two tidal basins of the German North Sea coast

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The response of coasts to global sea-level rise is highly variable. Knowledge of driving coastal parameters alongside the regional sea-level history is therefore indispensable when the response to global sea-level rise is to be assessed. Here, we study the Holocene relative sea-level of the south coast of the North Sea which is controlled by a number of very local parameters, as well as by regional glacio-isostatic adjustments. It is therefore crucial to restrict the data acquisition and evaluation to small coastal sections, ideally to single tidal basins, to minimize the sources of uncertainties (Bungenstock & Weerts 2010, 2012).
We present data from two tidal basins, Langeoog and Jade Bay. For Langeoog a database derived from 600 cores, 68 km of Boomer seismic data, 33 radiocarbon ages and 8 OSL dates is available. (Bungenstock & Schäfer 2009, Mauz & Bungenstock 2007). For the Jade bay, the database comprises sedimentary markers, pollen and macro remains derived from 68 cores. The sedentary chronology is based on 54 radiocarbon ages and pollen constraints (Wartenberg & Freund 2011, Wartenberg et al. 2013).
For both tidal basins the sedimentological record was interpreted in terms of the local paleogeographical development since about 7000 cal BP and its influence on the local relative sea-level curve.
While the trend of the relative sea level is similar for both tidal basins, it shows a different altitude. The timing of the main marine transgression within the Langeoog area takes place ∼3000 cal. BP whereas the sedimentological record of the Jade Bay shows two prominent transgressions, one for ∼5000 cal. BP and one for ∼3000 cal. BP.
The Langeoog palaeo-environment is continuously characterised by marine influence. Within the Jade Bay two different palaeo-environments could be identified, documenting that from the West to the centre the landscape development in the Jade Bay was drainage driven feeding the associated fen peat with minerogenic water but being autonomous from isochronic relative sea-level.
This all shows the importance to understand the differences of local landscape and depositional developments for a reliable interpretation of sea-level data.

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