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### **Morphodynamics of intertidal bars on wave-tide-dominated beaches: examples from northern France**

Processes responsible for sediment transport and morphological change on intertidal barred beaches experiencing large tidal ranges ( $> 4$  m) are still rather poorly known. A number of recent studies have explored the roles of wave shoaling, surf and swash, and of vertical and horizontal tidal excursion rates, on the mobility of intertidal bars. The present study contributes to a better understanding of the interactivity between these processes by comparing the morphology and hydrodynamics of two macrotidal beaches in northern France, characterised by spring tidal ranges exceeding 7 m and by equilibrium sediment budgets. The wave-generated cross-shore currents measured on the two beaches during calm and high wave-energy conditions were rather weak, and were subordinate to strong longshore currents generated by tides and by wind forcing. These strong longshore flows mitigated the intensity of the cross-shore flows and induced the longshore migration of medium-sized bedforms that largely explained short-term profile change. The prominent bar-trough systems in the mid-tide zone of both beaches remained stable in position although they underwent significant morphological change. Limited cross-shore bar migration on these beaches probably reflects a morphodynamic adjustment involving pronounced bars resistant to change, thus inducing morphological lag, and well-entrenched troughs maintained by channelled high-energy intertidal flows that evacuate groundwater, swash overflow and ebb tidal discharge.