

## Seasonal-scale morphological and dynamic characteristics of multiple intertidal bars

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**Summary.** A monthly survey of eight profiles of multi-barred macrotidal beaches east of the port of Dunkerque (Dunkirk), southern North Sea, was undertaken over 13 months with the aim of highlighting: (1) profile morphological characteristics (heights and locations of intertidal bars within the profile), (2) longshore, and (3) short-term (monthly) trends in intertidal bar-trough morphology and dynamics. The bars are largest, and show the highest concentration in the mid-beach zone, between mean low and high water neap tide levels. Spatial and temporal variations in bar morphology are set within the context of both a homogeneous sand composition and insignificant changes in profile volume over the 13-month survey. The profile morphological variations, thus, depend essentially on local wave conditions that are spatially modulated as a result of differential sheltering by breakwater structures and by a nearshore sand bank. The surveys show that bar construction requires moderately energetic conditions, and that bar construction and destruction phases are not just respective one-way functions of fair-weather waves and storms. The quasi-permanence of bar morphology reflects long morphological relaxation related to the macrotidal, fetch-limited low to moderate wave energy environment.