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## Temporal and spatial morphological variations along a cross-shore intertidal profile, Jiangsu, China

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### Abstract

1 Fifteen monthly field surveys were conducted from September 2012 to November 2013 at  
2 ten representative stations along a cross-shore profile, covering the entire tidal flat. Results  
3 indicate that tidal currents significantly affect bed level variations over bare flats, while  
4 subsurface processes (e.g., soil subsidence and expansion) are likely to play an important role  
5 in changing the bed level of the upper intertidal flat where salt marshes are present. The  
6 cross-shore profile shows a clear double-convex shape, and different geomorphic zones display  
7 distinctive variation. Above the mean high water level (MHWL), the bed level is generally  
8 stable. The region around the MHWL, where the upper convex point is present, is a location  
9 of high sedimentation due to the weaker hydrodynamic conditions and the settling and scour  
10 lag effects, it keeps growing with the increase of inundation frequency. A concave point occurs  
11 in the middle part of the intertidal flat, showing considerable erosion. Near the mean low  
12 water level (MLWL), the lower convex point is elevated due to the long-shore tidal current  
13 and associated sediment transport (the flood dominated transport during summer exceeds the  
14 ebb dominated transport during winter, hence the net effect favors sedimentation). Further  
15 seawards, the area below the MLWL is strongly eroded. The cross-shore profile follows

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