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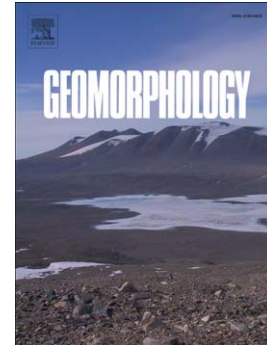
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Helene Burningham, Jon French

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## Understanding coastal change using shoreline trend analysis supported by cluster-based segmentation

Helene Burningham<sup>\*</sup>, Jon French

Coastal and Estuarine Unit, UCL Department of Geography, University College London, Gower Street, London, WC1E 6BT, UK

<sup>\*</sup>Corresponding author. Email address: h.burningham@ucl.ac.uk

### Abstract

Shoreline change analysis is a well defined and widely adopted approach for the examination of trends in coastal position over different timescales. Conventional shoreline change metrics are best suited to resolving progressive quasi-linear trends. However, coastal change is often highly non-linear and may exhibit complex behaviour including trend-reversals. This paper advocates a secondary level of investigation based on a cluster analysis to resolve a more complete range of coastal behaviours. Cluster-based segmentation of shoreline behaviour is demonstrated with reference to a regional-scale case study of the Suffolk coast, eastern UK. An exceptionally comprehensive suite of shoreline datasets covering the period 1881 to 2015 is used to examine both centennial- and intra-decadal scale change in shoreline position. Analysis of shoreline position changes at a 100 m alongshore interval along 74 km of coastline reveals a number of distinct behaviours. The suite of behaviours varies with the timescale of analysis. There is little evidence of regionally coherent shoreline change. Rather, the analyses reveal a complex interaction between met-ocean forcing, inherited geological and geomorphological controls, and evolving anthropogenic intervention that drives changing foci of erosion and deposition.

### Keywords

Coastal erosion, large-scale coastal behaviour, mesoscale, cluster analysis, Suffolk, UK

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