

## **Observed alongshore sandbar and shoreline variability at an open, fetch-limited beach**

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Sandbars often display an alongshore variable morphology (crescentic bars), which is often mimicked at the shoreline (megacusps). The processes resulting in these patterns are not yet clear and particularly the coupling between sandbar and shoreline deserves more attention. This contribution presents 8 years of video observations on the dynamics of crescentic bars and megacusps, including coupling, at the open, fetch-limited beach of Castelldefels (Spanish Mediterranean coast). Wave conditions were propagated from the nearest wave buoy to the study site (10 m depth). Crescentic bars and megacusps were detected visually from video images, after which the barlines and shoreline were extracted to compute characteristics like wavelengths, amplitudes and alongshore migration rates. Finally, the bar-shoreline coupling was evaluated using cross-correlation. Crescentic bars were only observed when the sandbar-shoreline distance was at least 10 m. They developed during lower energetic waves with both oblique and shore-normal angles, whereas straightening occurred primarily during high-energetic obliquely-incident waves. Megacusps only developed in the presence of a crescentic bar and were less pronounced and dynamic compared to crescentic bars. During megacusps presence, a highly-significant coupling was present during 73% of the time but the relative phase varied, partly due to different alongshore migration rates of the two patterns.