



Modelling observed shoreline dynamics of an embayed beach in Barcelona

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Changes in shoreline position may be modelled just by considering the gradients in total wave driven alongshore transport by the so-called one-line models. These models are 1D, are only applicable to large length and time scales (km's and yr's) and have a number of important limitations. A more accurate approach is provided by the 2D models which describe the evolution of the beach bathymetry in two horizontal dimensions. However, they are much more complex, computationally much more expensive and therefore not suitable for large length and time scales. An intermediate approach has been recently developed that fully describes the dynamics in the along-shore direction but describes the 'cross-shore dynamics' just in a parameterized way. This model (so-called Q2D-morfo) makes important improvements with respect to the one line models but is computationally much cheaper than fully 2D models. Here we will present some applications of Q2D-morfo to La Barceloneta beach, a 1200 m long embayed beach on the water front of Barcelona. In particular, we focus on some storm events where a significant rotation of the shoreline was observed. A comparison of observations and model predictions of both Q2D-morfo and a one-line model will be presented.