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The impact of two different storm seasons on a natural beach of the Gulf of Cádiz (Spain): high versus low energy events

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The response of a natural beach backed by a dune field in SW Spain was measured over two consecutive winter seasons. Field campaigns were performed before and just after storm events in order to estimate the volumetric changes on the upper and intertidal parts of the beach. The recovery volumes and slopes were estimated by topographic surveys undertaken on the first spring tide after the storm, and volumetric budgets were calculated for each storm event. The two winter seasons presented differences in storm intensity and distribution. First, a mild storm season (2008-2009) included a total number of 3 storm events/groups with a return period of about 1yr, spread over a period of 4 months with large recovery intervals between storms. The following winter season (2009-2010) was characterised by exceptionally low energy in the first weeks, followed by a series of storm groups that lasted over 2 weeks and produced significant damage over the entire coastline of the Gulf of Cadiz. The results from both storm seasons are compared both for the intertidal part of the beach, in terms of berm erosion and beach slope changes; as well as for the upper part of the beach, in terms of dune erosion and washover reactivation.