

Paper Number: 4267

Two contrasting beaches on macrotidal coasts: Byunsan and Gosapo beaches, west coast of Korea

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Numerous macrotidal beaches along the west coast of Korea are exposed to wind-generated waves and are also regularly subject to large tidal ranges. In spite of the similarities in tidal range and wave processes, the two macrotidal beaches investigated in this study, Byunsan and Gosapo beaches, exhibit different morphologies and sedimentary facies. In order to understand the factors responsible for their different characters, seasonal beach profiling, surficial sediment sampling, and box-coring were carried out along three transect lines over two years. Topographic surveys reveal that both beaches consist of two principal morphologic features, i.e., narrow sand beaches and extensive, low-gradient seaward tidal flats. In the case of Gosapo beach, the intertidal zone is located entirely below mean sea level and alongshore bars are little developed, this being characteristic of a wide low-tide terrace. At Byunsan beach, by contrast, alongshore bars regularly form above mean sea level during the storm season and then migrate onshore during the calm season. Sediments generally show a shoreward increase in mean size, but little changes are discernible on the flat intertidal zones. The two major morphologic features are thus dominantly controlled by wave processes in the beach sector and tidal fluxes in the intertidal flat sector, respectively. The low-tide terrace at Gosapo is likely due to a sediment deficit, whereas the convex bar morphology at Byunsan suggests a sediment surplus, probably associated with beach nourishment conducted in 2012. Thus, different sediment supply rates appear to be the main cause for the different morphological and sedimentary responses of the two beaches, which otherwise experience very similar physical conditions.

