Journal of Coastal Research	11	3	967	Fort Lauderdale, Florida	Summer 1995

DISCUSSION

Discussion of: Masselink, G. and Short, A.D., 1993. The effect of tide range on beach morphodynamics and morphology: A conceptual beach model. *Journal of Coastal Research,* 9(3), 785–800.

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INTRODUCTION

This paper explores, almost for the first time, the critical impact that tides can exert upon natural beach behaviour. As such, this work is extremely important and its techniques should be applied to many other beach systems and on a worldwide basis. The ratio of tidal range to the ambient wave climate *is* a very significant factor of beach behaviour and one that is usually ignored, but beach erosion or accretion is only the volume of sediment moved per wave, multiplied by the number of waves. The greater the tidal range, then the lesser number of waves that are available to affect each unit width of beach. It might thus be reasonable to suggest that the authors might care to analyse their site date accordingly, to check what impact (if any) that this parameter invokes.

Perhaps the only disturbing feature of the authors' study is the extremely limited range of breaking wave heights as compared with a wide range of tidal levels. It would appear that all the beaches listed in Table 1 are highly sheltered and subject to only short fetch waves *e.g.,* H_b of only 0.8 m or much less. In terms of ordinary ocean beach sediment transport, these waves would be regarded as little more than toys and barely worth study.

Then to compound the concerns over the real wave climate for the beaches listed, we are told that H_b is the "inferred modal breaker height" and T is the "modal wave period". It might be reasonable to expect that in a high quality study of this kind, at least somebody must have gone down onto all the study beaches and with a stopwatch detected the actual wave periods and rather closely evaluated the actual wave breaking heights. The actual wave conditions on a beach can be rather different from any inferred modal or spectral distribution values, sometimes vastly so. If the Masselink model is based entirely upon equilibrium beach gradient theory, then we might hope that it will also be tempered by seabed geological studies as well. The near shore submerged seabed sections of natural beaches can consist of many other (usually impervious) things than sands, but only free sand-rich beaches can be expected to meet any equilibrium theory—and sometimes this is also in grave doubt.

This must not take away from the high importance of this paper, the detail in the end, should resolve itself, but it is the *principles* that it evokes that are important. They should be extended much further and onto beaches that have low tidal ranges, to elucidate the total impact of tidal ranges on beaches, be they small or large. We on the Gold Coast of Queensland, Australia, monitor our beaches every day and on our beach system, within, in their terms, a constant and unique relative tide range and a constant and unique dimensionless fall velocity factor, we have over time, detected here *every* single beach shape that they show in their Figure 4. Some shapes have been transient, others holding a long life, but we have seen them *all.* We think that the authors' conceptual model must therefore be able to be made much more general than only for sheltered beach sites.