

ACCOMMODATION SPACE

The accommodation space within an estuary is the volume in which sediment could be deposited. One definition of accommodation space is therefore the volume between the estuary bed and the water surface at high water. As both the bed and water surface change over time, so the volume and hence the accommodation space changes. The rate of change is therefore influenced by the initial or 'antecedent' topography of the river valley, sea level change and the sediment supply (Rees *et al.* 2000).

The work to-date suggests that where the available accommodation space is limited, then channel migration with more extensive sand or mudflats is likely to be a characteristic of the estuary. In contrast, where the accommodation space is increasing with time, the conditions are more conducive to a stable channel alignment with the potential for intertidal areas to develop marsh vegetation. Examining how the accommodation space has changed historically can therefore give some indication of the degree to which the estuary environment may have changed and thus provide information on the relative stability of the system. By examining the space available above the present high water level and considering future sea level scenarios it is then possible to compare future projections of available accommodation space against the Holocene values and hence infer the likely estuary environment. Where an estuary is constrained by human developments, as well as the antecedent geological constraints, it can be informative to compare the situation with and without defences. Clearly the defences are limiting the available accommodation space. Depending on the degree of reduction that the defences introduce, it may be that there is greater potential for the estuary to adopt a migratory rather than stable channel form, with the corresponding geomorphological features (i.e. sand/mud flats rather than marsh habitat).

In order to carry out this type of analysis it is necessary to be able to define the basal topography of the estuarine sediments, as well as the high water surface and long-term sea level within the estuary. The approach therefore draws heavily on the techniques already outlined for Holocene Analysis, above. In particular, borehole data over the entire estuary domain (including the full extent of the floodplain) is needed to establish the base of the Holocene sediments and provide some indication of maximum water levels over time. Inevitably this tends to limit the application of this method to those estuaries with sufficient data, although an indicative assessment may be possible in situations with only limited data, using modern topographic maps and some knowledge of the solid geology.

The technique can thus be an input to the Holocene Analysis ([Humber Holocene chronology](#)), and can also be used to assess the implications of future management options, Paper 11 in [EMPHASYS Report](#). The results to-date indicate some characteristic signals in the Holocene record of accommodation space, which are not yet fully understood and are the subject of ongoing research.

References

Rees JG, Ridgway J, Ellis S, Knox RWO, Newsham R, Parkes A, 2000, Holocene sediment storage in the Humber Estuary, In: Shennan I, Andrews JE (Eds.), Land-ocean evolution perspective study, Geological Society, London, pp. 119-143.