HOLOCENE ANALYSIS

For most estuaries the change in sea level since the last ice age has had a major influence on their evolution. As sea levels rise, former river valleys are progressively drowned to become estuaries. This basal surface defines the space within which the estuary is formed. The subsequent development of the estuary then reflects the rate of sea level change, any uplift, subsidence or consolidation of the landmass, and the available sediment supply. Because of the way these various parameters interact it is common for an estuary to exhibit periods of transgression, when the estuary moves landward, and progression, when it moves seaward, over the time scale of centuries to millennia. Trying to identify these changes provides a context for the present form of an estuary and can often indicate the bounds within which future evolution is most likely to take place.

Such an investigation will usually make use of a range of field and analysis techniques, such as:

- Borehole records and cores
- Seismic reflection surveys
- Particle size, heavy mineral and geochemical analysis (Ridgway *et al*. 2000)
- Radiocarbon dating of the sediments (Godwin & Willis, 1961; Stuiver & Reimer, 1993)
- Pollen analysis (Godwin, 1940; Moore *et al*. 1991)
- Foraminifera analysis (MacFadyen, 1933; Scott & Medioli, 1980)
- Geoarchaeological investigations (Mellalieu *et al*. 2000)

The results for these various techniques are then used to reconstruct the geological and stratigraphic sequences, assign dates to particular horizons and establish a relative sea level curve for the area. Some good examples of this type of analysis are to be found in (Shennan, 1986a; Shennan, 1986b; Long *et al*. 1998). Ultimately this may be presented as a simple chronology of change (Humber Holocene chronology), or in the context of a behavioural model, such as the transgressive/progressive model (Long *et al*. 2000), or the highstand model (Roy, 1984; Woodroffe *et al*. 1993).

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