

Barrier Beaches – Scoping Study

Notes on Steering Group meeting – 31st October 2005

Discussion on the scope of the proposed research:

It seemed to be agreed that the research should concentrate on the management of barrier beaches, principally in the context of coastal defence, i.e. to reduce the risks of flooding and erosion, rather than concentrating on understanding and predicting the evolution of such features (although some element of understanding/ modelling “processes” may be appropriate).

The principal concerns regarding these beaches, from a coastal / flood defence viewpoint, are:

Flooding

There are three flooding mechanisms that need to be considered, namely:

- Through-flow (leaking) with water passing through the beach below its surface;
- Overtopping, where waves and tides propel water over the crest of the beach; and
- Breaching, where beach crest levels fall to below sea level leading to “weiring” flows through the beach.

Erosion

The changing morphology of the beach, particularly landward migration of its crest, can directly threaten assets built on the beach (as at Pevensy) or directly behind it. Possibly the lowering of a barrier beach could also expose the hinterland to direct erosion in some circumstances, e.g. Keyhaven Marshes behind Hurst Castle Spit.

The research will consider intervention methods that have been used to reduce the above threats, principally by identifying didactic case histories. It was suggested that up to eight of these case histories would be presented, although reference may be made to other similar (or contrasting) cases as well.

The type of beach of interest in this research is not solely the “barrier beach” in the strict geomorphological sense, but would include other similar beaches, for example the “necks” of spits. It was suggested that a suitable definition of beaches of interest would involve them satisfying criteria such as:

- Having low-lying land to their rear, typically but not necessarily flooded at some or all tidal states;
- Being “narrow”, e.g. the distance between the MHW contours on seaward and landward faces less than (say) 50m -100m; and

- Having the ability to (and usually a history of) moving landwards, e.g. in response to sea level rise or sediment starvation while retaining a similar cross-sectional shape.

These criteria are initial suggestions and will probably need to be refined in the light of the findings of the first phase of the research, i.e. the scoping study. Note here that the plan-shape of the beaches qualifying as “barrier beaches” is not crucial.

It seems likely that most qualifying beaches in England and Wales will be of gravel/ shingle or of the “shingle upper/ sand lower” type. There may be a few sand beaches that qualify, such as The Hinge at East Head near West Wittering, although these are likely to have dunes on their crest, thus adding to the complexity of the geomorphological processes involved.

Methods to be used

A number of different approaches to the first, i.e. scoping phase of this research, including:

- Location/ mapping/ data collection of barrier beaches (England/ Wales);
- Review of geomorphological literature/ classification/ predictive methods;
- Publicity/ engagement/ discussion by leaflets/ web-site/ telephone conversations/ visits;
- Review/ collation of management objectives/ concerns/ constraints;
- Review of past/ existing management practices/ successes and failures (see Annex A);
- Review of predictive modelling methods (long-term/ empirical, short-term computational/ laboratory);
- Review of available monitoring data (historical maps, beach surveys/ tidal levels, waves etc);

Actions/ programme

A number of short-term actions were identified at the meeting namely:

Literature review to cover;

- Case histories
- Predictive methods/ models for overtopping/ breaching/ through-flow/ recession;
- Geomorphological approaches;
- Qualifying beaches in England/ Wales.

Publicity/ dissemination;

- Review of research project web-sites (e.g. SNS2, SANDPIT);
- Design/ initial population of project web-site;
- Preparation of “introductory” leaflet for dissemination;
- Identification of consultees and methods of engagement of managers.

Progress reporting

- Updates on web-site;
- Periodic emails to Steering Group members.

Annex A

<i>Major Recharge/ recycling</i>	Hurst, Heacham to Snettisham, Greatstone.
<i>Intermittent small-scale addition of sediment</i>	Weybourne (perhaps others?)
<i>Groyning (with/ without recharge etc)</i>	Slaughden, Pevensey, Northern Seawall at Reculver, Sandy Point, Sandbanks
<i>Crest "stabilisation"/ raising</i>	Chesil (gabions), Weybourne (Chris English "special")
<i>Drainage improvement</i>	Chesil
<i>Core "strengthening"</i>	Tyre bales at Pevensey
<i>Reprofiling</i>	Medmery (Selsey west) and Cley/ Salthouse
<i>Breastworks/ Wave breakers (mid-beach face)</i>	Pevensey/ Lancing