

## Joint Defra / EA Flood and Coastal Erosion Risk Management R&D programme

### Background to R&D project

The R&D has been completed by the EstProc Consortium from a 3-year research project which had the following two main aims:

- Improved understanding and modelling of hydrobiosedimentary processes; and,
- Improved understanding and modelling of sediment erosion and deposition and, hence, the capability to predict the resulting changes in estuary morphology.

The project team covered the disciplinary headings of modelling and process research in hydrodynamics (waves and currents), sedimentary (sands and muds) and biological processes (vegetation and marine organisms). More information is available at [www.estproc.net](http://www.estproc.net)

The research focussed on topics, which were defined by previous research, and revealed by modelling, to be ones where shortfalls existed in definition of the processes and interactions, which constrained the application for prediction. The advances in understanding were made by further analysis and collation of data (data interrogation). The results built on the planning done in the Inception Report (FD1905/TR1) and have been described in three technical reports.

### Results of R&D project

The research has led to the development of new ideas and algorithms as described in reports FD1905/TR2 and TR3. Where appropriate, existing wave-current-sediment 'bottom-up' process models were adapted and used to demonstrate that the algorithms could be implemented directly into models. The models were then used to test the algorithms and to explore the sensitivity and relative importance of particular processes or interactions. The shortcomings of the models themselves as simulation tools and the difficulties sometimes faced with using measurement-based determinations of sediment parameters within these models have been explored.

The outcomes of the research are improved knowledge and understanding of estuary processes relating to prediction of hydrobiosedimentary parameters (FD1905/TR2). Also it has been possible to produce improvements on existing predictive algorithms for application by estuary modellers and to generate new algorithms covering a wider range of parameters (FD1905/TR3). Finally, key datasets accessed during the project have been documented in a separate report (FD1905/TR4).



## R&D Outputs and their Use

The output reports, listed below, provide information for Defra, the Environment Agency and their consultants about estuarine processes and constitutes an R&D output from the Joint Defra / Environment Agency Flood and Coastal Erosion R&D Programme. They are intended for use by experienced modellers who are able to exercise judgement on the applicability of the work to specific situations. Reliance on the information presented in the reports is not a substitute for the necessary expertise or site specific studies and investigations.

EstProc Consortium (2002). Estuary Process Research Project (EstProc): Inception Report. Report prepared by the Estuary Process Consortium for the Defra and Environment Agency Joint Flood and Coastal Processes Theme. Report No FD1905/TR1.

EstProc Consortium (2005a). Integrated Research Results on Hydrobiosedimentary Processes in Estuaries. Final Report of the Estuary Process Research Project (EstProc). R&D Technical Report prepared by the Estuary Process Consortium for the Fluvial, Estuarine and Coastal Processes Theme. Report No FD1905/TR2 – Synthesis Report.

EstProc Consortium (2005b). Integrated Research Results on Hydrobiosedimentary Processes in Estuaries. Final Report of the Estuary Process Research Project (EstProc). R&D Technical Report prepared by the Estuary Process Consortium for the Fluvial, Estuarine and Coastal Processes Theme. Report No FD1905/TR3 – Algorithms and Scientific Information.

EstProc Consortium (2005c). Integrated Research Results on Hydrobiosedimentary Processes in Estuaries. Final Report of the Estuary Process Research Project (EstProc). R&D Technical Report prepared by the Estuary Process Consortium for the Fluvial, Estuarine and Coastal Processes Theme. Report No FD1905/TR4 – Metadata Report.

This R&D Technical Summary relates to R&D Project FD1905 and the following R&D output:

**R&D Technical Report FD1905/TR1 – Title as above.** Published September 2002.

**R&D Technical Report FD1905/TR2 – Title as above.** Published March 2006.

**R&D Technical Report FD1905/TR3 – Title as above.** Published March 2006.

**R&D Technical Report FD1905/TR4 – Title as above.** Published March 2006.

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Research Contractor: HR Wallingford and consortium

The above outputs may be downloaded from the Defra/EA Joint R&D FCERM Programme website ([www.defra.gov.uk/environ/fcd/research](http://www.defra.gov.uk/environ/fcd/research)). Copies are also available via the Environment Agency's science publications catalogue (<http://publications.environment-agency.gov.uk/epages/eapublications.storefront>) on a print-on-demand basis.

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Further copies are available from:  
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[www.defra.gov.uk/environ/fcd/research](http://www.defra.gov.uk/environ/fcd/research)

