

EXECUTIVE OVERVIEW OF ESTPROC

Project Inception Report, September 2002

Purpose

The DEFRA funded Estuary Process Research project (EstProc) started in December 2001 and has the following stated objectives:

- Innovative and fundamental research in estuarine hydrodynamics, sediments and biological interactions
- Improved underpinning knowledge and sound scientific results for the estuary research community and end users

The specific scientific objectives defined in the Terms of Reference were as follows, subdivided under three technical headings (denoted Themes within the project) namely, hydrodynamics, sediment processes and biology:

Hydrodynamics

1. To improve the *modelling of waves in estuaries*;
2. To improve the prediction of the *impact of extreme events and major anthropogenic influences*;
3. To investigate the *interrogation of existing data* to extract further information, interrelationships and correlations between parameters;
4. To improve the *representation of near bed stresses*.

Sedimentary Processes

1. To undertake further investigation into the *transport of mixed sediments*, where mixed sediments includes sand, mud, gravel or shell mixtures and dredged material with sizes upward of 5 microns;
2. To expand the *understanding of the sediment transport profile*;
3. To improve the *understanding of general sedimentary processes*.

Interactions Between Biological and Sedimentary Processes

1. To review and prioritise, at an early stage, the relevant *biological process parameters* that effect the stability, erodability and deposition of sediments;
2. To undertake investigations into the *effect of biological processes* on the stability, erodability and deposition of sediments. Format results for incorporation into existing models for morphological prediction and assess validity through use in different models;
3. To develop understanding of the *impact of benthic life* (primarily macrofauna) on performance of intertidal areas and the effect of the change in flow regime related to tidal stage.

Project Overview

A 3 year multi-disciplinary, integrated research project has been defined by the EstProc project team, which comprises:

- HR Wallingford
- Proudman Oceanographic Laboratory
- Professor Keith Dyer / University of Plymouth
- St Andrews University, Gatty Marine Laboratory (Sediment Ecology Research

Group)

- ABP Marine Environmental Research
- WL | Delft Hydraulics
- Plymouth Marine Laboratory
- University of Cambridge, Cambridge Coastal Research Unit
- University of Southampton, School of Ocean and Earth Sciences
- Digital Hydraulics Holland B.V.
- Centre for Environment, Fisheries and Aquaculture Science

The research is undertaken in an integrated fashion and each one of the themes has a designated Theme Leader to oversee the conduct and delivery of the research, which tackles key issues related to the delivery of:

- Improved understanding and modelling of hydrobiosedimentary processes
- Improved understanding and modelling of sediment erosion and deposition and the resulting changes in estuary morphology

The project is being run in 3 sequential stages:

Stage 1 – Improving focus and synergy (months 1 to 3)

A key activity in this Stage was the kick-off workshop which was attended by the entire project Consortium and Funders' representatives to brainstorm the detailed make-up of the project. The workshop clarified linkages between research topics and data sources, as well as identifying external links to other process based and engineering research. Activities completed in this Stage of the project led to the production of the Inception Report detailing the conduct of the programme in Stages 2 and 3.

Some secondary milestones have been defined in terms of some key integrating objectives:

- Tidal flat sedimentation – a key environment in which the research results must be demonstrated to operate in a harmonious fashion;
- Mudflat-saltmarsh interactions – a key area of the estuary fringe for fluxes of water and sediment, and a role as high water storage;
- Scales of interest – at what time and space scales should the assessment of various estuarine processes be made;
- Data task – interrogation of existing datasets for an improved understanding of hydrodynamic, sediment and biological processes and their interactions;
- Integrated morphological modelling – a key tool for implementing the new research findings and assessing their suitability in the subtidal and intertidal reaches of estuaries. The knowledge produced by the project can be used to improve the capability of predictive tools and methods and hence directly underpin their use in management activities.

Stage 2 – Delivering the science (months 4 to 30)

In this Stage of the programme all the technical work is planned for completion. The project team will participate in two workshops during this stage of the research at which the results will be presented and discussed. At these workshops progress will be facilitated by the secondary milestones defined in Stage 1 and by smaller technical

meetings organised as required by the Task Leaders.

Stage 3 – Synthesis and outcomes (months 31 to 36)

The main effort in this Stage will be on documenting the scientific results from the previous 30 months in an integrated fashion, and to present them in such a way that they match the Quantifiable Deliverables associated with each of the Scientific Objectives defined in the Terms of Reference.

Dissemination and timetable

On completion of Stage 1

- Inception Report;
- Initiation of project web site through HR Wallingford which can be located at www.estproc.net ;

On completion of Stage 2

- Scientific Reports and Papers that have been produced by the partners;

On completion of Stage 3

- A workshop will be held as an open presentation to the scientific and engineering community concentrating on scientific and technical achievements and discussing the best ways for the audience to access them;
- Final report summarising in clear English the principal results and conclusions, and how the users of the research can pick up and implement the results;
- Specific reports and papers produced both individually and on a collaborative basis detailing technical aspects of the work undertaken;
- Improved methodologies or algorithms for representing processes and their interaction in estuaries;
- A data report detailing the data used in the project and how the data can be utilised in future projects; and,
- An update on future research requirements in the field of estuarine process research that will underpin the long-term goal of developing the Estuary Impact Assessment System.

Publicity for the project will be achieved through the web site as well as articles in the press, newsletters (including the DEFRA newsletter).

The deliverables and timetable for the project are described in more detail in the Inception Report. The two key events with respect to accessing the project results are:

1. An open scientific workshop to be held in July 2004; and,
2. The publication of the final deliverables, which is scheduled for November 2004.

Updates for these events will be published on the project web site as appropriate.

The project Inception Report report presents an appreciation of the main challenges and the scientific work proposed to achieve the above.

For more details please contact the EstProc Project Manager Richard Whitehouse (rjsw@hrwallingford.co.uk) or the Funders' Nominated Project Officer Jonathan Rogers (jonathan.rogers@mouchel.com).