

Risk Assessment of Coastal Erosion

Technical Summary: FD2324

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

Background to R&D project

The aim of RACE (Risk Assessment of Coastal Erosion) was to develop, test and disseminate a robust and consistent probabilistic method for assessing the hazard and risk of coastal erosion. A method was required that could be supported by data and information from monitoring programmes and risk-based inspections with outputs that represented risk and hazard in a manner comparable with the RASP (Risk Assessment of flood and coastal defence for Strategic Planning) method used for flood risk assessment.

Results of R&D project

The methodology that has been developed is based on the source-pathway-receptor risk model. Thus, the various sources of the erosive forces and how they propagate to their point of impact are determined before the magnitude of the effect on receptors is assessed. A range of analytical techniques have been developed, with the choice of which to adopt dependent on the level of detail required for each assessment and the extent and quality of data that is available - this will ensure that proportionate effort is applied at all times, a basic principle of the methodology.

The source data is determined by a range of techniques of varying complexity, as appropriate to the level of analysis being undertaken. These techniques include approaches for assessing the potential failure of coastal defences over time and the unconstrained, natural erosion of the coastal landforms. The pathway stage brings together these two components to establish the hazard, i.e. the probability of erosion taking account of defence influence. The final receptor stage combines the erosion assessment with spatial (receptor) data to make the risk assessment.

The project team, led by Halcrow, included the University of Plymouth, Terry Oakes Associates and Mark Lee (independent consultant). The Steering Group comprised representatives from national, regional and local government, the Environment Agency and Academia.



End-users were consulted at various stages during the project. An initial round of consultation was undertaken in order to establish the needs of end-users. Further consultation was conducted later on to disseminate what had been produced to end-users and to request their participation in trials of the final deliverable. A review of existing knowledge was undertaken at the start of the project to locate any information of relevance, with this exercise including published reports and technical papers as well as erosion assessment methods, tools and available data sets.

Although not a project deliverable, spreadsheets were developed in order to validate the methodology that had been developed. This exercise also proved that software could be developed for the entire methodology. Internal testing of the overall methodology was undertaken as far as possible by the project team using data available to them. Volunteer end-users also tested the methodology with their own site specific information - as such, the methodology has thus been subject to industry review.

R&D Outputs and their Use

The methodology developed by the project has been taken forward at a national level by the Environment Agency to produce draft coastal erosion risk maps (Making Space for Water Project HA4b).

This R&D Technical Summary relates to R&D Project FD2324 and the following R&D output:

R&D Technical Report FD2324 – Title: *Risk Assessment of Coastal Erosion*, Published January 2008.

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The above outputs may be downloaded from the Defra/EA Joint R&D FCERM Programme website (www.defra.gov.uk/envir/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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