



HR Wallingford
Working with water

Coastal harbours

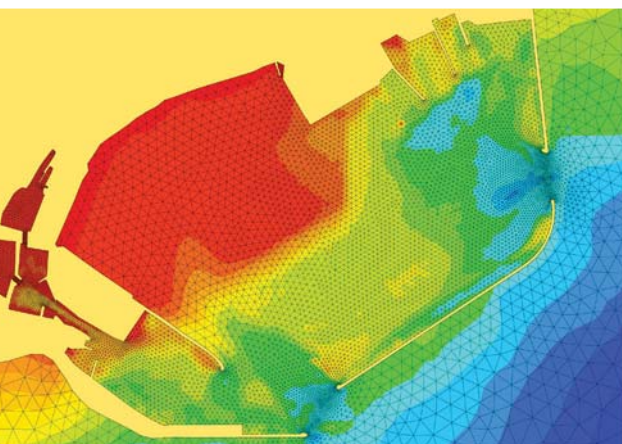
Protecting marine assets



Coastal harbours

Coastal harbours must be designed to withstand extreme storm conditions and minimise environmental impact. This needs to be achieved whilst providing safe and efficient mooring facilities within the economic constraints.

HR Wallingford has developed an integrated suite of techniques which can be used in conjunction with the expertise and experience of our engineers and scientists to examine and optimise the design of coastal harbours.



Wave prediction

- > Offshore wave climate for any location world-wide
- > Transformation to the nearshore area to provide site-specific wave climate and extreme conditions

Wave disturbance

- > Design wave conditions at proposed berths and other key areas of the harbour including harbour resonance
- > Effect of a new development on downtime at existing berths
- > Impact of wave conditions in areas adjacent to the harbour.

Flow modelling

- > Assess how changes in flow patterns around and within the harbour will affect:
 - existing coastal processes on the adjacent coastline
 - sedimentation and dredging strategies within the harbour
 - ship handling and navigation



Navigation

- > Optimise width, depth, and alignment of the approach channel, turning and berth areas
- > Minimise expensive dredging and construction requirements
- > Advise on the position of navigation aids and tug requirements

Ship mooring analysis

- > Analysis of the motion of moored ships at berths, including the effects of passing vessels.
 - Evaluate expected downtime at proposed new berths
 - Predict the effect of a new development on existing berths
 - Optimise the mooring configuration
 - Optimise dredge depth.

Sedimentation and dredging

- > Capital and maintenance strategies to minimise volumes and costs
- > Dredged material disposal options including evaluating the options for the disposal of contaminated sediments
- > Compliance with environmental and planning legislation

Environmental impact assessment

- > Services to assist in the resolution of environmental issues and the preparation of planning applications and licenses.
- > Evaluation of existing environment (physical and social)
- > Evaluation of measures to minimise potential impacts.

Coastal impact assessment

- > Assess the impact of a harbour on neighbouring beaches
- > Define measures to mitigate against erosion or accretion caused by a coastal harbour

Breakwaters

- > Optimise both vertical and rubble mound breakwaters using computational and physical modelling techniques to ensure stability and hydraulic performance.

Engineering design

- > Integrate all aspects to produce the optimum engineering solution to ensure that the schemes assessed and modelled are appropriate, buildable and cost effective from feasibility right through to completion.



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HR Wallingford is an independent engineering and environmental hydraulics organisation. We deliver practical solutions to the complex water-related challenges faced by our international clients. A dynamic research programme underpins all that we do and keeps us at the leading edge. Our unique mix of know-how, assets and facilities includes state of the art physical modelling laboratories, a full range of numerical modelling tools and, above all, enthusiastic people with world-renowned skills and expertise.

