

Marine forecasting services

For safe and efficient operations



Forecasting for the coastal marine environment



HR Wallingford provides high resolution, site specific forecasts and warnings to a range of clients based on world-leading global and regional wind and wave forecasts with bespoke wave transformation and response models.

Decision support

Safety and security

Reducing the risk of danger to the public and contractors.

Construction

Managing operations during construction and reducing the risk of damage to/loss of plant.

Operations

Improving efficiency of operations and logistics of vessel routing, marine, port and onshore facilities.

Maintenance

Managing routine and extraordinary inspections and maintenance.

Leisure

Event planning.
Public safety and security of property.

Forecast and warning services

Metocean conditions

Wind, wave, current and water level.
Wave transformation to the coast.
Wave disturbance within ports and harbours.

Structure response

Wave overtopping, cliff recession rates and beach run-up.

Surf zone parameters

Breaker type, surf zone width, number of breakers, breaker height.

Vessel response

Ship mooring and underkeel clearance within ports, along the approaches, and at offshore moorings.





Implementation and delivery

Services

- > Localised site specific wave and associated response models set up and calibrated by HR Wallingford
- > Optional daily support from Met Office forecasters
- > Lead time up to 120 hours (long range 10-day forecasts available)
- > Deterministic and probabilistic forecasts available

Dissemination

- > Delivered as a service or supplied as configured software
- > Updates typically provided twice a day
- > Forecasts served up on a dedicated website showing graphical and tabular data
- > Forecast alerts via email or SMS

Software

- > Integration with global and regional wind, wave and surge forecasts from providers such as the Met Office and ECMWF
- > Integration with site environmental monitoring and management systems
- > Adheres to best practise open exchange standards for marine data

Validation and calibration

- > Forecast services can be validated for accuracy and timeliness against measured / monitored data
- > Site specific models can be calibrated and warning criteria tuned in light of operational experience



Providing practical forecasting solutions

Lynn and Inner Dowsing Wind Farm, Outer Wash, UK

- > High resolution forecasts of wave conditions provided during construction of offshore wind farm
- > 2D area SWAN spectral wave model wave forecasts hosted on a dedicated website
- > Validated against offshore and nearshore wave rider buoys
- > Data gathering and storage from in-situ met station and wave measuring devices displayed against forecasts

Dawlish seawall, Devon, UK

- > Demonstration wave overtopping forecast based on transformation of Met Office WAVEWATCH III wave model using local SWAN model
- > Tide and surge level forecasts from Met Office CS3X
- > Near real time validation against co-located wave measurements from Channel Coast Observatory
- > Overtopping rates predicted using EurOtop methods
- > Forecasts hosted on web

Vlore, Albania

- > Wind and wave forecasts provided for weather sensitive construction work within Vlore Bay
- > Service based on SWAN model of the Adriatic Sea, driven with Met Office North Atlantic European model winds with a high resolution SWAN grid in Vlore Bay
- > Forecasts issued as pdfs to the site manager

Chile LNG

- > Wind and swell wave forecasts provided for the operational phase of an LNG terminal on the Chilean coast
- > Service based on Met Office Global atmospheric and wave models with SWAN spectral wave transformation inshore
- > Forecasts used by terminal for planning safe marine operations

Other recent applications

- > Nearshore wave forecasts for pipeline tow-out operations through surf-zone, Scotland
- > Warnings based on wave overtopping and cliff recession rates provided to Network Rail Scotland for management of coastal defence inspections
- > Wave and surf forecasts provided to the Royal Navy for NATO exercises
- > Wave overtopping hazard-warning system provided to Eurotunnel Developments to control access to Samphire Hoe promenade (operational since 1997)
- > Probabilistic wave overtopping forecasts developed, in collaboration with the Met Office and Proudman Oceanographic Laboratory, as part of a research project for the Environment Agency
- > High resolution forecasts of wave conditions over the construction site at Gunfleet Sands Offshore Wind Farm, Outer Thames Estuary
- > Wind, wave and current forecasts for the deployment phase of an LNG terminal on the Italian coast