



Metocean

Using extensive knowledge and understanding of the marine environment, combined with cutting edge innovation and proven existing technologies, Cefas offers a range of meteorological and oceanographic (metocean) services, including monitoring, modelling and consultancy.

Our in-depth experience and successful project track-record extends to both public and private sectors, in the UK and internationally.

Our capability

With the benefit of our knowledge and experience, we can engage with the customer to design an integrated metocean solution for a project, to both meet the regulatory monitoring requirements, in addition to underpinning all necessary decision making processes.

Project success is then achieved using a range of delivery mechanisms including the deployment of relevant instrumentation, the use of alternative data sources, and a suite of modelling services.

For this purpose, Cefas own and operate a range of floating and submersible monitoring systems, in addition to vessel based instrumentation and shore-based measurement techniques.



Marine based monitoring

Cefas has developed a series of seabed mounted measurement platforms (Landers), which can be chosen to reflect the environmental conditions expected.



Cefas Landers (below) can be mounted with an array of sensors selected to address the objectives of the project. Sensor options include:

- acoustic Doppler current profilers (ADCPs)
- acoustic wave and current (AWAC) recorders
- optical backscatter sensor
- dissolved oxygen
- temperature
- salinity
- sediment traps

Moored surface platforms, such as the Datawell Directional Waverider (below), allow assessment of metocean parameters at fixed locations, with capability to build a robust long-term data set.

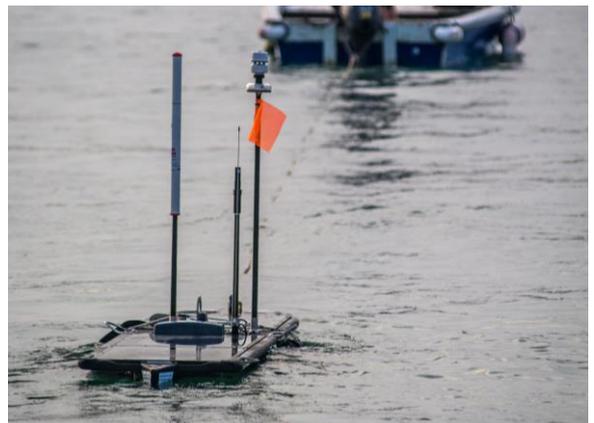


Such platforms can be complemented by surface vehicles, including research/survey vessels and unmanned surface vehicles (USVs) to enable considerations of spatial variability.

For Cefas to provide these complementary services, a range of instruments and sensors can be mobilised to Cefas' research vessel, RV Cefas Endeavour, and a Liquid Robotics Waveglider.

Combined, moored and mobile surface platforms provide the capability to undertake:

- Surface wave measurements
- meteorological measurements
- vessel mounted current profile transects
- Water column profiling
- Discrete water sampling
- Seabed sampling



Suspended particulate matter recorded within acquired water samples can be used to provide in-situ verification and calibration of turbidity sensor output, enabling time-series measurements of suspended sediment concentrations.

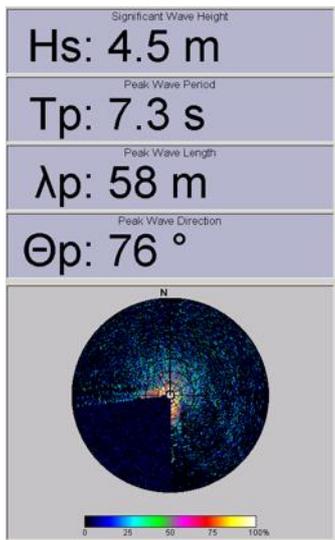
Additionally, where water sampling is not possible, turbidity sensors can be calibrated before/after deployment using Cefas' turbidity tank.

Land based marine monitoring

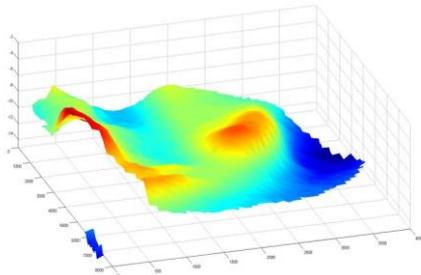
Cefas has developed a range of land based measurement techniques for measurement of metocean parameters.



Coastal marine conditions, including wave parameters and surface current velocities, can be measured using a standard marine X-Band radar and specially developed software. Spatial resolution and range are variables determined by the nature of the instrument's installation and project requirements.



Coupled with time-lapse video imagery, X-Band radar can also allow an assessment of coastal geomorphology and bathymetric features.



Coastline monitoring

Using Cefas' own CAA pilots, Cefas can undertake aerial surveys of the foreshore to provide digital elevation models and high resolution imagery to assist with projects crossing from the marine to the terrestrial environment.



Previous projects have included coastline defence assessment following storm surge flooding and overtopping events.

Cefas have also developed a unique high-resolution sediment transport survey capability using thousands of individually identifiable radio-frequency ID tagged particles.

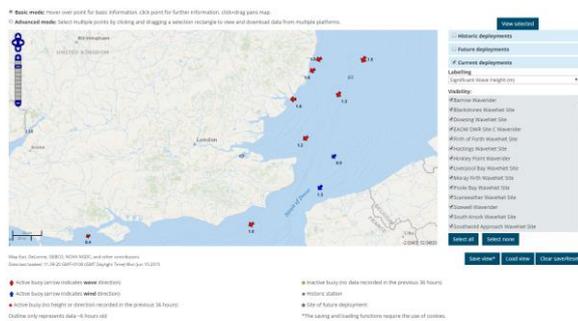


Using a towed receiver, sediment transport surveys can be quickly undertaken, highlighting the mobility regimes in place for specific sediment types/sizes.



Data delivery and presentation

Using a range of technologies including HF radio, GSM, and satellite (Iridium and Orbcomm), metocean data can be telemetered from platforms in near-real time to provide accurate data to clients with minimal delay.

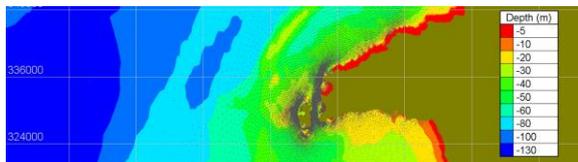


WaveNet (www.cefas.co.uk/wavenet) is an example of how data can be acquired, telemetered and presented, thus enabling widespread information-sharing and information based decision-making.

Designed to implement Defra's strategic wave monitoring network for England and Wales, and to provide a single source of real-time wave data from a network of wave buoys located in areas at risk from flooding, the WaveNet site specifically benefits from the contribution of privately funded wave data measurements in near-real time.

Modelling

Data acquisition, delivery and presentation can then be coupled with high resolution metocean modelling, with spatial resolution down to 150m.



Unlike a number of existing products, Cefas models consider the important interaction between seabed bathymetry, speed and direction of tidal currents and the direction of wave propagation.

Experience

Cefas has deployed metocean survey equipment in a wide range of locations – from the Deep sea (e.g. Iberian Abyssal Plain – 6,000m water depth; the Greenland-Iceland-Faeroe Ridge), to Shelf seas (e.g. Southern North Sea – to 5 m water depth; Eastern Irish Sea).

The latter high energy environments (due to combined wave and tides) are especially challenging and require careful selection of weights and moorings to ensure seabed mounted instrumentation remains stable (with consideration for storm environments and the nature of seabed sediments).



As a result, Cefas has obtained a knowledge and understanding of the marine and coastal environment which can be applied for the success of future projects.

Enquiries

Should you require further information regarding Cefas' metocean monitoring or modelling capability, or alternatively if you feel your organisation may be able to contribute to the WaveNet programme, please contact James Parker on +44 (0) 1502 524529, or alternatively mail metocean@cefas.co.uk.