



Earth Observations

Cefas is establishing itself as a new leader in the development and delivery of novel applications for existing and emerging Earth Observation data collected by satellites, as well as by remotely piloted aircraft.

Thanks to Cefas' involvement in remote sensing projects, innovative support is now being provided to all levels of government and industry for enhanced marine monitoring and improved food security.

Our services

Our experienced team is identifying ways in which marine monitoring can be improved on both regional and global scales, while simultaneously mitigating high costs associated with such work by integrating freely available data from earth observation (EO) satellites. Current projects are building bespoke multidisciplinary scientific solutions for a range of end-users, including governmental agencies, academia and the private sector.

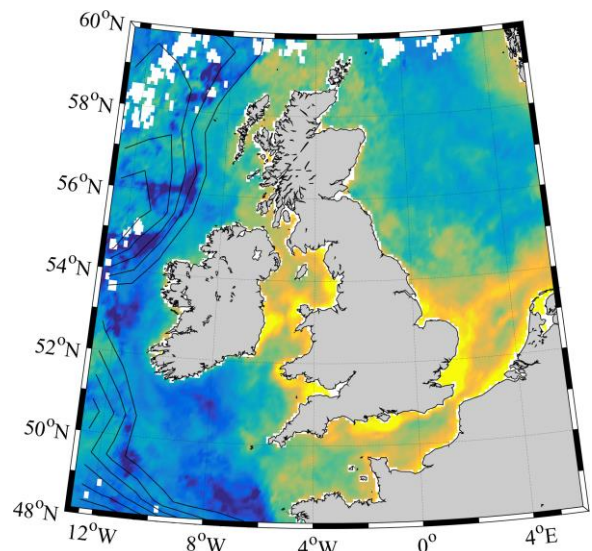


Figure 1: MODIS image of the 1% light level to measure water quality. calculated using Lee et al. (2007)

Our science

In recent years, with EO data showing value in key fields, Cefas has steadily increased engagement with and use of remotely piloted aircraft (RPA) and satellite-derived products. As a result, Cefas has a growing relationship with EO technology, and remote sensing data is already applied in the following areas:

1. Real time wave data from Cefas' Wavenet buoy network contributed to validation of ERS2 and JAS1 satellites. New Sentinel datasets under Copernicus will take the place of these decommissioned satellites.
2. Integrating remotely sensed ocean colour and sea surface roughness, Cefas provides an emergency response system to track oil and chemical spills in UK waters. Under the CleanSeas project funded by the MCA, EO data is also used to track pollution from tanker cleaning and ballast discharges.
3. SmartBuoy *in situ* observations of water quality are used to validate remotely sensed turbidity, Chl-a and light attenuation, and will be used for validation of, and assimilation into, climate models. With Defra support, this work has been carried out in collaboration with RBINS (ex MUMM, Belgium) and Ifremer (France). Currently, work is carried out under the EU project Highroc.
4. Under the EU Devotes project, Cefas is partnered with PML to provide *in situ* observations of phytoplankton for estimating shelf sea primary production, and for development and validation of a Harmful Algal Bloom (HAB) detection algorithm.
5. Cefas' government to government projects, particularly in Kuwait, use Landsat8 data to evaluate shoreline changes in remote areas. Ocean colour and HABs data are used to guide Kuwaiti Marine Monitoring Strategies.

Newer projects within Cefas are integrating several layers of existing satellite data for enhanced marine monitoring, with the express purpose of integrating Sentinel-3 data once operational (launch late 2015).

Equipment

Cefas is able to make use of EO data collected by RPA and a range of satellites, including: MODIS, VIIRS, Landsat8 and Sentinel-2. Ocean colour data from Sentinel-3 will be integrated when operational.

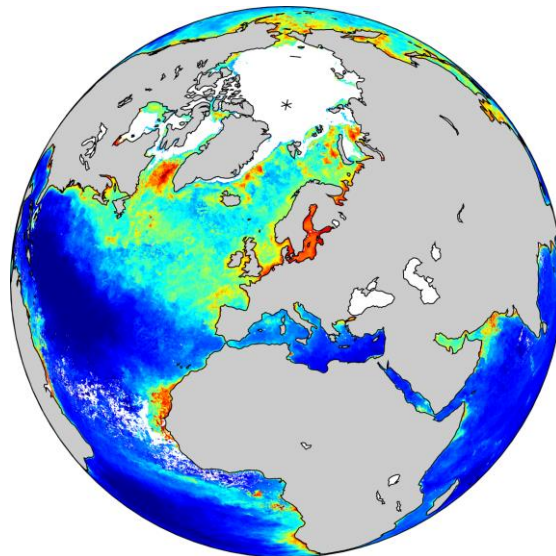


Figure 2: MODIS image of chlorophyll-a concentrations during the boreal spring of 2015.

Enquiries

For further information on our satellite-derived Earth Observation services, please contact Lauren Biermann on +44(0)1502 562244 or lauren.biermann@cefas.co.uk. Alternatively, please contact Tiago Silva on tiago.silva@cefas.co.uk.

For further information on our remotely piloted aircraft Earth Observation services, please contact Tony Dolphin on +44(0)1502 564268 or tony.dolphin@cefas.co.uk.



Figure 3: True-color MODIS image (Jacques Descloitres, MODIS Land Rapid Response Team, NASA/GSFC)