



Earth Observation (EO) for Modelling

Earth Observation is often the source of key baseline data into numerous models e.g. land cover, terrain. EO is often one component of more complex processes such as modelling the valuation of ecosystem services, predicting impacts of hazards and future scenarios.

This document highlights three examples and indicates their ease of adoption.

Case Study: Climate Change Initiative (CCI) Above Ground Biomass



Uses a variety of radar and optical satellite data as inputs into a model to retrieve above ground biomass estimates. This product is useful for assessing sequestration of carbon in woody and herbaceous vegetation. Product is global scale.



EO provides many proxies for vegetation structure (methods clear but complex) as input into models which are complex and require training to understand output and how best to integrate the product into decision making. Product has a higher spatial resolution than required for most climate modelling.



Resource required to determine whether Wales specific datasets would improve global scale product.

Case Study: Flood Resilience Modelling Tool for the British Virgin Islands (BVI)



Uses LIDAR data captured by UK Hydrographic Office to provide high resolution bathymetry, and habitat maps created from optical earth observation data to inform a model that estimates the role of nature-based solutions in reducing the risk of hazards such as storm surge and flooding.



EO provides essential landscape information (methods clear and straightforward) to inform risk model (method clear but complex).



Would need effort to establish in house system and to calibrate the model for the Welsh landscape.

Case Study: Diffuse Pollution & Water Quality Monitoring



Uses Crop Map for England (CROME) created from Sentinel-1 time series data and elevation data created from LIDAR and aerial photography data, coupled with other variable data such as soils to model risk of diffuse pollution (e.g. from nitrates). Model is packaged as Farmscoper tool and output enables prioritisation of monitoring.



EO provides essential landscape information (methods clear and straightforward) to inform risk model (method clear but complex).



Would need effort to establish in house system to use Farmscoper which is open source, but once in place can be run and managed by a small team.

Policy Areas

Flooding / Cyanobacteria / Species Detection / Coastal Erosion / Future agricultural scheme / Monitoring and Compliance / Plant health

Contact point:

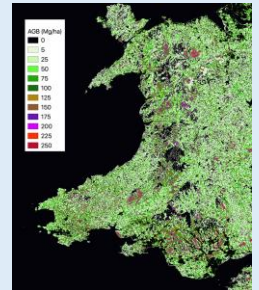
earthobs@jncc.gov.uk

Complexity

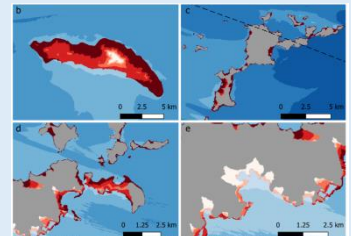
- Possible; needs research
- Clear method but complex
- Clear method and straightforward

Resource

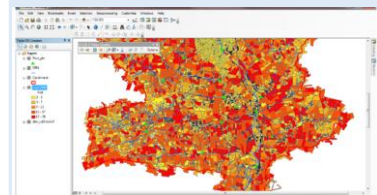
- £££ High
- ££ Medium
- £ Low



Example of Above Ground Biomass estimates from CCI Biomass.



Modelled terrestrial flooding risk (red) and marine risk (blue) from Hurricane Irma for the BVI.



Example of output risk from diffuse pollution model, Farmscoper.

Reference to any specific product or entity does not constitute an endorsement or recommendation by JNCC or Welsh Government. Other products may be available.