

Enabling Transformation - efficient use of EO data

Summary

The Defra Earth Observation Centre of Excellence (EOCoE), coordinated by JNCC, is a virtual team bringing together expertise from the surrounding departments and public bodies, across activities and funding a range of innovative projects. Key to the success of these projects is efficient access to the large and complex satellite data made freely available from the Copernicus program, in a standardised, familiar format.

Work Involved

As an EOCoE member, JNCC are leading the technological innovation for the automated processing of raw satellite data to a product ready to use: 'analysis ready data' (ARD). The Sentinel 1 and Sentinel 2 satellites provide full coverage of the UK every 5-6 days. This project ensures that the data is acquired automatically when it becomes available from the Science and Technology Facilities Council data store and then immediately processed using ARCSI software to an agreed standard using a complex set of steps. Once ready for use it is then published to Geoserver and made available for view and download through a web application designed for Geospatial data (Geonode). A suite of webservices and an API have also been created to further enable use in GIS desktop tools. The current project is building on several previous feasibility and investigative projects led by JNCC and is being developed in partnership with Scysis.

Key Outcomes

The central production of an agreed data format ready for the public sector to use will save 50-70% of the expected costs for each new application. It therefore reduces duplication of effort and storage and lowers the barriers to use, particularly for those organisations without the expert EO skills needed to transform the raw data or the bandwidth or storage facilities. It also encourages innovation and efficiency.

Current Marine Applications

AIMM is a Cefas project delivered in partnership with Cranfield University. It is using the centrally processed Sentinel-1 data combined with vessel tracking data and machine learning techniques to investigate the feasibility of automated detection and identification of vessels over 12m. Outputs will also include vessel density maps at different temporal resolutions. Monitoring human activities at sea has wide impacts in terms of security, safety, sustainability and protection of the environment.

Identified Research Applications

- Using Sentinel-2 webmapping services to monitor change of oil-rig decommissioning within marine protected areas
- Using Sentinel-1 to detect and monitor aquaculture

Further information

<https://defradigital.blog.gov.uk/2017/09/07/process-once-use-everywhere/>
<https://defradigital.blog.gov.uk/2017/01/17/sentinels-of-our-environment/>
<https://defradigital.blog.gov.uk/2017/03/13/sentinel-2b-improving-on-defras-earth-observation-capability-for-data-science-and-outcomes/>

Country: UK

Main Driver: Efficient use of satellite data

Period of work: 2016 - Present

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Partnership: Defra Group, Devolved administrations, Statutory Nature Conservation Bodies, Science and Technology Facilities Council, Scysis. Cefas and Cranfield University.



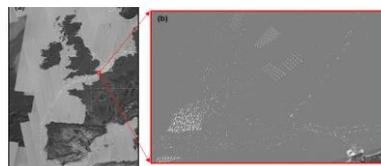
Sentinel 2 data from Copernicus (2017). Left: Raw data and Right Processed by JNCC



Sentinel 2 data from Copernicus (2017) processed by JNCC. Algal bloom off the coast of Shetland



Sentinel 2 data from Copernicus (2017) processed by JNCC. Sedimentation and windfarm, Great Yarmouth



AIMM: Rapid analysis of 4,179 Sentinel 1 radar images to build a density map (left) and water use spatial patterns Jan-May 2016 (right)