Caroline Herschel Framework Partnership Agreement for
Copernicus User Uptake

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JNCC

Llywodraeth Cymru
Welsh Government

Earth Observation (EO) for Change Detection

Earth Observation has been used to successfully detect changes in the landscape at various scales. This has been a mainstay of commercial services, particularly in urban areas for some time. Environmental applications have great potential, but fewer operational examples exist. Three such examples, and their ease of adoption, are explored below.

Case Study: Living Wales – Use of Planet Data

As part of the development of an Earth Observation Strategy, Welsh Government are running a 6 month project to test the usefulness of daily commercial VHR satellite imagery supplied by Planet. This has many change detection applications, such as its use detecting burn scars from the Rheidol Valley Fires and monitoring non-compliance with illegal waste regulations.

Research is ongoing but early indicators suggest good potential (weather permitting) to provide intelligence but would need to be risk based i.e. knowing what will or can change in advance.

Planet data requires a licence, and further research is required before its use can become operational.

🔴 ££

Case Study: JNCC Change Detection Tool

A decision-support tool that uses indices derived from Sentinel-1 and Sentinel-2 data and EO-derived habitat maps, to highlight areas of habitat with unusually high or low index values and to track change in index values over time.

Proof of concept app currently being tested at 8 pilot sites across the UK. Feedback from site managers and habitat specialists will inform development.

Further development is under way to bring this from a proof of concept to an operational application. Once operational, Storage and processing costs medium but high if Wales wide ARD has to be generated for this purpose only, and not generically provided.

🔴 ££

Case Study: SEPA Illegal Waste

SEPA has demonstrated success on a small site-by-site basis for detecting certain types of illegal waste disposal using Sentinel-1 Single Look Complex (SLC) data, which can be used to detect subtle movements and changes in surface elevation to flag for further investigation.

The scalability of this to support cloud-based processing techniques for a national basis is currently being explored, with further development work required.

The results of the scalability study will determine the resourcing required, but if successful, staff costs should be low as national processing will be automated, but there will be costs associated with use of cloud computing.

🟡 ££

Policy Areas

Flooding / Waste and Waste Crime / Slurry and Septic tank spills (identifying tanks without a permit) / Landslides / Compliance / CAP / Operations / Compliance monitoring / Land Cover / Future agricultural scheme monitoring and compliance / Compliance through near time change detection of land cover information / EO inclusion in Future Regulations Agricultural Act / National Forest indicator / benefits monitoring

Contact point:
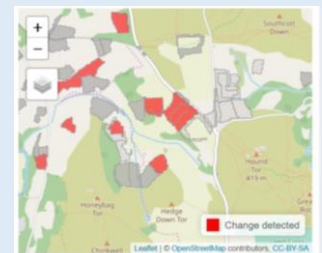earthobs@jncc.gov.uk

Complexity
🔴 Possible; needs research
🟡 Clear method but complex
🟢 Clear method and straightforward

Resource
£££ High
££ Medium
£ Low

Rheidol Valley, the day after the fires

JNCC Change Detection Tool, with red areas showing where change has been detected

SEPA Illegal Waste Project coherence product example – darker pixels indicate low coherence and therefore change in elevation