

Earth Observation (EO) for Agriculture: Mapping Crops

Earth Observation has been used successfully for summer crop mapping of main types in the UK. Classification accuracy will vary between crops for all examples and will not include some types e.g. small crop stands less than 0.5ha.

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

Case Study: Living Wales crop map method



Uses time series Sentinel-1 Analysis Ready Data (ARD) to generate information on growth stages and physical states of crops and to create annual crop maps (2018 now available). No field survey data or trained algorithm required to generate an output, so approach may be more sustainable than others.

Method used is tested on various areas across Wales producing high classification accuracies and showing more consistent results compared to machine learning methods, but staff training required to understand how method works for operational use. Landscape is split into real-world objects e.g. field-by-field.



££

Difficult to implement currently as case study is still in research phase; needs work for setting up operational system. Storage and processing costs medium but high if Wales wide ARD to be generated for this purpose only, and not generically provided.

Operational Product: Crop Map for England (CROME)



Uses time series Sentinel-1 and Sentinel-2 ARD coupled with survey data collected by field inspectors, to train a machine learning algorithm to create accurate crop maps annually (2016-present). Timed to support evaluation of payments. England only.

Method used is operational and well understood and produces very high classification accuracies. Landscape is split into honeycomb structure to capture within field differences.



££

Would need effort to establish in house system but once in place can be maintained by a small team. Storage and processing costs medium but high if Wales wide ARD has to be generated for this purpose only, and not generically provided.

Research Product: UKCEH Land Cover® Plus: Crops



Uses time series Sentinel data coupled with survey data collected by field inspectors, to train a machine learning algorithm to create a crop map output annually (2016-present). Timed to support research needs. UK wide coverage.

Method used is operational and well understood. Accuracy information not readily available for all years but is assumed high and stable following 2016 validation exercise. Landscape is split into real-world objects e.g. field-by-field.



£

Product is licensed and has a license fee, but open for research use. Maintenance is low as product creation covered in license costs by UKCEH.

Policy Areas

Agri and Environmental Statistics / Reporting / Future agriculture scheme / Monitoring and Compliance / Land cover

Contact point:

earthobs@jncc.gov.uk

Complexity

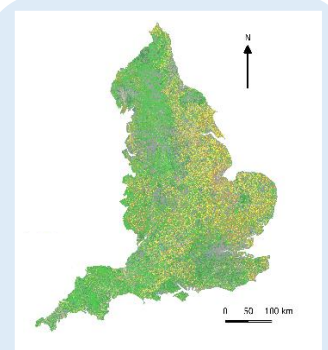
- Possible; needs research
- Clear method but complex
- Clear method and straightforward

Resource

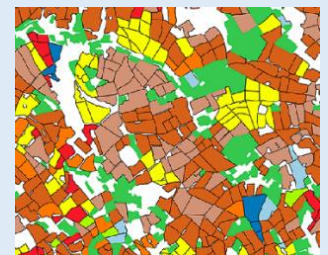
- £££ High
- ££ Medium
- £ Low



Example from the Living Wales crop map method.



CROME product from 2016.



Example from the UKCEH product.

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